



Unless otherwise noted, reuse of this document is allowed under a Creative Commons Attribution license. This means that reuse is allowed provided appropriate credit is given and any changes are indicated.

The complete report from which this chapter is extracted can be freely downloaded from esreda.org.

Enhancing Safety: The Challenge of Foresight

ESReDA Project Group *Foresight in Safety*

Chapter 11

The Whistle-Blowers: Active-Actors in Foresight for Safety

Yves Dien
Paulo Maia
Sever Paul
Sverre Rød-Larsen
John Stoop
Eric Marsden

Table of contents

11.1	Introduction	195
11.2	The Issue	196
11.3	Definition of “Whistle-Blowers”	197
11.4	Examples of Whistle-Blowers	198
11.4.1	Whistle-Blowers in Industry	198
11.4.2	Whistle blowing in the military	201
11.4.3	Note on the Role of Whistle-Blowers in Industry	202
11.4.4	Whistle-Blowers in Civil Society	203
11.5	Features of Whistle-Blowers and of Whistleblowing in Industry ..	210
11.6	Position of the Company Towards Whistle-Blowers in Industry ..	211
11.7	Features of Whistle-Blowers and of Whistleblowing in the Civil Society	212
11.8	Position of ”Society” Towards Whistle-Blowers in Civil Society ..	213
11.9	Treatment of An Alert	213
11.10	Protection of Whistle-blowers	213
11.10.1	At the European (Union) level	214
11.10.2	United Kingdom	214
11.10.3	France	215
11.10.4	The Netherlands	215
11.10.5	Norway	216
11.10.6	Romania	216
11.10.7	Portugal	216
11.10.8	United States of America	217
11.10.9	Remarks on Protection of Whistle -Blowers	217
11.11	Conclusion	218
11.12	References	219



11 The Whistle-Blowers: Active-Actors in Foresight for Safety

Yves Dien, Collectif Heuristique pour l'Analyse Organisationnelle de Sécurité (CHAOS), France,
Paulo Maia, Energias de Portugal (EDP), Portugal,
Sever Paul, Agenția de Investigare Feroviară Română (AGIFER), Romania,
Sverre Røed-Larsen, SRL Health Safety Environment Consulting, Norway,
John Stoop, Kindunos Safety Consultancy Ltd, the Netherlands,
Eric Marsden Fondation pour une Culture de Sécurité Industrielle (FonCSI), France.

Executive summary

Even if industrial accidents are felt as a surprise, their investigation studies show that they do not occur by chance. They result from the degradation of safety. Issue to detect symptoms of degradation in order to act before the event. In addition to conventional foresight practices (i.e. "tools" for prevention) studies of accidents also show that, in many cases, some persons launched alerts about safety level decreasing. Take advantage of information provided by these persons could help for avoiding occurrence of accidents. Unfortunately, these whistle-blowers are not listened, not to say, worst, they are harassed or put aside by their management or even by their colleagues. Often, management either is unable or denies alerts, knowing that they make sense only after the event. Nevertheless, alerts and whistle-blowers have characteristics that allow them to be identified and differentiated from "moods" and "bad spirits". Remaining question, which is arising, is how to protect whistle-blowers from disciplinary sanctions and harassment.

11.1 Introduction

"The freedom to speak the truth is one of the pillars of democracy"
Polybius (c. 200 – c. 118 BC), The Histories, XII

"O monstrous world! Take note, take note, o world
to be direct and honest is not safe!"

Shakespeare (1564 – 1616), Othello, III, iii

Current, relevant and interesting debates about industrial safety call into question the relevance of some concepts whose definitions and approaches have seemed, so far, to be widely shared. One such concept is that of safety. Does safety mean avoiding things that could go wrong or ensuring that things go right? Are causes of events to be found in failures, errors and malfunctions – the operational dark side – or should we consider that both expected and unwanted outcomes occur in the same way (Hollnagel, undated; Hollnagel, 2014)? In some countries, the concept of safety has been developed as a kind of "umbrella concept", covering both unwanted events within the safety field and intended events (security). Safety is also, in this new tradition, integrated in the modern SHE Safety, Health, Environment approaches and is strongly linked to risk and events which may occur both in the working environment and in the external environment and to both health risks of employees and to third parts.

In many of these discussions, the focus of safety approaches is still mainly on the avoidance of adverse events. In spite of undeniable progress in recent decades, many experts share the view that safety has reached an asymptote (Frantzen, 2004). Facing this problem, practitioners are trying to find new ways in order to improve safety management.

Does the problem arise in the same terms in the field of societal safety? First of all, we note that industrial safety is a part of the societal security domain that is global. In addition to technical failures, it includes protection of society and response to incidents, emergencies and disasters caused by intentional or unintentional Organisations are generally not a monolithic whole, a homogeneous entity. Sometimes, within the midst of the organisation, some dissident voices alert the powers-that-be about potential safety problems. Could these persons, whom we call "whistle-blowers", help to improve levels of safety? Could they help to meet the challenge of foresight for safety?

11.2 The Issue

Current Industrial safety approaches and practices mainly rely on two pillars: risk analysis and learning from experience.

Risk analysis can be broadly described as the process of risk identification and measurement. In that case, risk mitigation is a tool to avoid unwanted events or to minimize the impacts of their occurrence. Quantitative risk analysis seeks answers to questions such as the following:

- What are the events, with negative safety impacts, that could occur?
- What is their likelihood?
- What would be consequences of their occurrence?⁵⁹

Risk analysis allows us to define the “**notionally** normal starting points” of the industrial process, meaning (i) “initial culturally accepted **beliefs** about the world and its hazards” and (ii) “associated precautionary norms set out in laws, codes of practice, mores and folkways”⁶⁰ (Turner and Pidgeon, 1997, p. 72). Because theoretical knowledge evolves with time, analysing risks is a continuous process.

In spite of substantial efforts in terms of methodology and successes in terms of results due to risk analysis, some events happen during production. These events are analysed in order to figure out causes of their occurrence and to determine and implement improvement(s). Industries, especially high-risk industries, have set up operating feedback systems for learning from experience. It is the second pillar of industrial safety approaches. Unfortunately, it seems that industries have reached a limit in terms of results. They hardly progress, they are “*dancing a tango on asymptote*” (Frantzen, 2004), meaning that, from year to year, numbers of safety records are more or less the same (either slightly higher or slightly lower). Does it mean that “learning from experience” is in a state of persistent deadlock?

Occurrence of an event can be described from two different points of view. On the one hand, the operating feedback system is **reactive** (the conventional approach), that is, an event is seen as a surprise, as an “exceptional set of unfortunate circumstances” (Finn, 2002). Nowadays, safety management is more foresight-oriented, considering a situation as “an accident waiting to happen”, i.e., when we

are living during the “incubation period”⁶¹ of an event. Indeed, “[a]ny event is generated by direct or immediate causes (such as a technical failure or “human error”). Nevertheless, its occurrence and/or its development is considered to be induced, facilitated or accelerated by underlying organizational conditions (complex factors) and some warning signals exist prior to the event” (Dien, 2006, p. 148). So, the goal becomes to assess degradation of the safety level in detecting the warning signals, near-misses, and **weak signals**... In that sense, our operating feedback systems need to become **proactive**.

The concept of weak signals exists in several areas such as history, geology, medicine, acoustics... It was more recently coined by Vaughan (1996) in the domain of industrial safety after the space shuttle *Challenger* disaster: “A weak signal is one conveyed by information that is informal and/or ambiguous, so that its significance [...] is not clear” (Vaughan, 1996, p. 355). Essentially, a weak signal is a symptom of a degradation of the production system.

Turner and Pidgeon (1997) describe these kinds of signals, “visible” during the incubation period, as a “set of events”. They observed that these events go unnoticed. Indeed, unfortunately, even if detection and treatment of weak signals seems a promising way to go, it appears quite difficult to precisely define what a weak signal is. Its features are (Vaughan 1996):

- Qualitative (in contrast with quantitative);
- Subjective;
- Inconclusive;
- Giving partial information;
- Ambiguous, meaning several interpretations are potentially possible.

Furthermore, weak signals could be repetitive. In that case, repeatability itself is the criterion for identification. In this perspective, both qualitative and quantitative features are useful to validate its relevance in the context of the analysis (identification and selection) of weak signals. For example, a retrospective analysis of an accident can detect a weak signal based on its relevance (quality) and frequency (quantity) for a particular accident. Although it will not help prevent that accident, it can be useful to avoid similar accidents.

⁵⁹ Qualitative risk analysis, as for it, uses words or colours to identify and evaluate risks or presents a written description of the risk

⁶⁰ Emphasis added.

⁶¹ “Accumulation of an unnoticed set of events which are at odds with the accepted beliefs about hazards and the norms for their avoidance” (Turner and Pidgeon, 1997, p. 72).

Detection of a weak signal relies on an engineer's feelings, intuition, perceptions rather than rational and scientific demonstration. In that sense, a weak signal is not in line with *"the norms of quantitative, scientific positivism"*⁶² (Vaughan, 1996, p. 355). Indeed, it may even be in conflict with such norms and consequently, challenge the validity of such norms.

Furthermore, often, in terms of safety, a signal makes sense only after an event has occurred. In other words, the meaning of signs related to safety is not obvious, and organisations put in place systems for collecting and gathering signs that they do not really know what to do with except compiling statistics on accumulated data. Furthermore, companies have to cope with two concerns:

- Taking into account and treating a "wrong" signal (i.e., a signal that did not impact safety), which would lead to waste resources and time. However, such signals *could be* symptoms of other type of weaknesses or problems in companies, as weaknesses connected to the company culture, to shortcomings in leadership or management, to misconduct concerning social responsibility etc.
- Not detecting a relevant signal, which would be symptomatic of poor safety management and could lead to a major event.

So, here is a key question: Is it worth investing in the collection and treatment of weak signals, especially if we do not even recognise the weak signal? And here is another question: How should we define the relevant and accurate features of a weak signal?

The analysis of major events often shows that, in many cases, they were preceded by alerts, warnings launched by persons close to (or knowing) how a system technically functions.

Organisations are generally not a monolithic whole, a homogeneous entity. Sometimes, within the midst of the organisation, some dissident voices alert the powers-that-be about potential safety problems. Could these persons, whom we

call "whistle-blowers", help to improve levels of safety? Could they help to meet the challenge of foresight for safety?

11.3 Definition of "Whistle-Blowers"

So far⁶³, there is no common legal definition of a whistle-blower, and a lot of different perceptions.

Nevertheless, before proceeding further, let's define the term "whistle-blower" (or whistleblowing). The implied definition mainly refers to the societal domain.

For Wikipedia, a *"whistleblower (also written as whistle-blower or whistle blower) is a person who exposes any kind of information or activity that is deemed illegal, unethical, or not correct within an organization that is either private or public"*⁶⁴.

For the British Government *"You're a whistleblower if you're a worker and you report certain types of wrongdoing. This will usually be something you've seen at work - though not always."*

*The wrongdoing you disclose must be in the public interest. This means it must affect others, for example the general public"*⁶⁵.

According to Near and Miceli (1985), whistleblowing is *"the disclosure by organization members (former or current) of illegal, immoral, or illegitimate practices under the control of their employers, to persons or organizations that may be able to affect action"*.

Chateauraynaud and Torny⁶⁶ (1999) make a distinction between "prophets" whose message is future dedicated and "whistle-blowers" (denouncers) who condemn past and ongoing events. Nevertheless, in both cases, the aim is to avoid occurrence of unwanted events and/or negative outcomes.

ADIE (2008) added a notion explaining that a *"whistle-blower is anyone who discloses or helps to disclose fraud, irregularities and similar problems"*. So, a whistle-blower is not only the one who acts, but also the one who supports.

⁶² Let's remember that when engineers of the space shuttle O ring manufacturer raised an alert concerning the performance of seals in cold temperatures, NASA decision-makers challenged them to prove it by quantifying their concerns!! (Vaughan, 1996).

⁶³ Chapter written in 2018.

⁶⁴ <https://en.wikipedia.org/wiki/Whistleblower>, retrieved March 31, 2018.

⁶⁵ <https://www.gov.uk/whistleblowing>, retrieved March 31, 2018.

⁶⁶ They were the first French scholars who tackled this issue. The French concept is *"lanceur d'alerte"* which means in a word-for-word translation *"alert launcher"*.

The Council of Europe (2014) considers that a whistle-blower is “any person who reports or discloses information on a threat or harm to the public interest in the context of their work-based relationship, whether it be in the public or private sector”.

For the European Commission (2018), “whistle blowers are people speaking up when they encounter, in the context of their work, wrongdoing that can harm the public interest, for instance by damaging the environment, public health and consumer safety and EU public finances.”

For Edward Snowden⁶⁷ (2019), a whistle-blower is “a person who through hard experience has concluded that their life inside an institution has become incompatible with the principles developed in - and the loyalty owed to – the greater society outside it, to which that institution should be accountable”. From his point of view such a person “knows that they can’t remain inside the institution, and knows that the institution can’t or won’t be dismantled”.

So, in conclusion, the definition of a whistle-blower seems to have developed in the last decades:

- From only related to internal company conditions/employees to issues related to institutions and organizations of public interest
- From narrow subjects (e.g. types of wrongdoing) to a wider group of threats or harms
- From a single actor to group action (supporters).

However, it is important to emphasize an important distinction: whistleblowing should not be confused with the statutory obligation of information established in a number of countries: many companies within different industrial branches, health and care institutions, transport operators, etc. and some occupational groups (e.g. doctors, nurses) have a special reporting obligation, including conditions that have safety relevance. In an attempt to distinguish between different reactions to negative working environment conditions among workers, a researcher distinguished between insulted employees, whistle-blowers, complaints and messages from employees favouring openness (“bell ringers”).

⁶⁷E. Snowden is a whistle-blower (see § 11.4.4.3).

11.4 Examples of Whistle-Blowers

Whistleblowing is not a recent concept. If we immerse ourselves in mythology, we already may find, in tales of ancient Greece, persons who warned their compatriots. Perhaps the most famous was Cassandra, Princess of Troy, daughter of King Priam and Queen Hecuba, who spoke true prophecies. Unfortunately, a curse struck by Apollo had the consequence that her true prophetic statements would never be believed. Laocoon, a Trojan priest, warned the citizens of the deceptive nature of the horse, but was killed with both of his sons by sea serpents, sent by Poseidon.

11.4.1 Whistle-Blowers in Industry

11.4.1.1 A Committed Nuclear Engineer

Let’s return to our times, where we wish to draw your attention to a decision made in January 1996 by the US Nuclear Regulatory Commission (NRC) ⁶⁸, to put the three units at the Millstone nuclear power plant (NPP) in Connecticut on the Watch List. This action allows the NRC to order the shutdown of a unit and to authorize its restart only under certain conditions.

This decision was motivated by serious unsafe practices in the operation of the plant (during the refuelling process). It was not the consequence of an incident nor **did it result from an investigation or an audit carried out by the Safety Authority**. It was the result of determined, voluntary and pugnacious action by a NPP senior engineer, named George Galatis. As early as 1992, he became concerned about the management of spent fuel that did not comply with regulatory safety requirements. He warned his hierarchy, but they did not take his alert into account. In the next two years, nothing changed, except that Galatis was isolated and bullied within the plant. In 1994, he took the initiative to directly alert the NRC, knowing that the NRC had been aware of the plant practices for the previous 10 years and had not taken any corrective action. Faced with the persistent apathy of the NRC, Galatis decided, in August 1995, and in connection with an NGO, to petition the NRC to suspend the Millstone I licence for 60 days and deny the company's request for an amendment of the regulatory requirements concerning

⁶⁸ American Nuclear Safety Authority.

fuel unloading. (Miller, 1995; Pooley, 1996). The pressure on Galatis redoubled, but the case became public, and the NRC was forced to react.

The “stubborn crusade” of this engineer earned him a long article and the cover of the American magazine TIME.

11.4.1.2 A Product Engineer Involved in Safety

On 3 March 1974, Turkish Airlines Flight 981 crashed over the Ermenonville Forest, north of Paris, few minutes after its taking off from Orly airport. The 346 people on board of the DC-10 airplane died.

The direct cause of the accident was an explosive decompression, due to a broken cargo door at the rear of the plane. It led to a collapse of the passenger compartment floor that cut all wires necessary to control the aircraft. The plane became uncontrollable and crashed to the ground.

A similar event had happened two years before. On 12 June 1972, the rear cargo door of American Airlines Flight 96 DC-10 blew off while flying over Windsor, Canada. Because they were fewer passengers (67 persons), decompression led to (only!) a partial collapse of the compartment floor with (only!) a partial restriction of the controls. In spite of the situation, the pilot was able to land safely.

Fifteen days after this event, Dan Applegate, Director of product engineering for Convair, a McDonnell Douglas subcontractor involved in the DC-10 design, wrote a document known as the “Applegate Memorandum”. Applegate gave it to his immediate supervisor. In the memo, he mentioned some concerns. The long memo stated, among other things:

“The potential for long term Convair liability has been causing me increasing concern for several reasons:

- The fundamental safety of the cargo door latching system has been progressively degraded since the program began in 1968.*
- The airplane demonstrated an inherent susceptibility to catastrophic failure when exposed to explosive decompression of the cargo compartment in 1970 ground tests.*

[...]

⁶⁹ Emphasis added by authors Eddy et al.

“Since Murphy's Law being what it is, cargo doors will come open sometime during the twenty-plus years of use ahead for the DC-10”

[...]

“I would expect this to usually result in the loss of the aircraft”

[...]

“it seems to me inevitable that, in the twenty years ahead of us, DC-10 cargo doors will come open and I would expect this to usually result in the loss of the airplane” ⁶⁹(Eddy et al., 1976, pp. 183-185)

Applegate's supervisor considered that it was needed to *“look the “other side of the coin”*” (Eddy et al., 1976, p. 186).

Convair vice-president in charge of the DC-10 project convened a meeting to decide the company's policy regarding this issue. Convair management thought that changes requested from the memo would be costly and it was not sure which company would pay the bill (Convair or McDonnell Douglas). During this meeting, it was acknowledged that Applegate was closer than his supervisor to the engineering of the DC-10. Nevertheless, the reasoning of the supervisor was preferred and the *“interesting legal and moral problem”* was resolved *“by deciding that Convair must not risk an approach to Douglas”*. [...] *most of the statements made by Applegate were considered to be well-known to Douglas and there were nothing new that was not known to Douglas* (Eddy et al., 1976, p. 187). So, Douglas was never officially informed about Applegate's concerns.

11.4.1.3 A Field Journalist

On the night of 2 - 3 December 1984, a toxic cloud of methyl isocyanate (MIC) spread over the city of Bhopal, Madhya Pradesh, 600 kilometres south of Delhi. The cloud made its way especially into and around the shanty towns located near the Union Carbide India Limited (UCIL) pesticide plant. The disaster eventually created about 600,000 victims, including more than 12,000 deaths.

The cause of the disaster is still under debate. Nevertheless, we could assume that slack management leading, among other things, to deferred maintenance which created a situation where routine pipe maintenance caused a backflow of water

into a MIC tank, triggering the accident⁷⁰. Before the accident, the plant was idling with reduced staff (Shrivastava, 1992; Lapierre & Moro, 2001).

Several serious events preceded the catastrophe. On 23 December 1981, a phosgene (toxic gas) leak occurred during a maintenance shutdown and caused the death of Mohammed Ashraf, foreman of the plant. Union Carbide concluded that the causes of the accident were two human errors. However, the trade unions claimed that the accident resulted from a deterioration of the plant's safety levels since the rules of procedure prohibited the storage of phosgene when the treatment unit was out of service. On 10 February 1982, a new gas leak occurred on a phosgene pump: 25 people were intoxicated⁷¹. Factory workers launched a strike.

Rajkumar Keswani, owner of and reporter for the local newspaper, the "Rapat Weekly", was an acquaintance of Mr. Ashraf. He wanted to know if his death was an accident or the consequence of internal failures at the pesticide plant. With the collaboration of plant workers, he was able to visit it illegally. After consulting scientific books, he came to the conclusion that *"tragedy was only a matter of time"* (Lapierre and Moro, 2001, p. 264). He also obtained results of an audit carried out in May 1982 by three engineers from the technical centre of the parent company in the United States. Its conclusions concerning safety of the plant were alarming. The audit report revealed hundreds of deviations from both operational and safety rules. He also underlined the high staff turnover, the lack of training and insufficient operating procedures.

With this information at the end of his investigation, Keswani tried to alert the public by writing a series of articles with prophetic titles:

- *"Please, spare our city"*, on 17 September 1982. In this article, he warned: *"If one day misfortune happens, do not say you did not know."*
- *"Bhopal: 'we are all sitting on the crater of a volcano'"*, on 30 September 1982.
- *"If you refuse to understand, you will be reduced to ashes"*, on 7 October 1982.

⁷⁰ Union Carbide Corporation, owner of the plant at the time of the accident, claimed it was due to sabotage.

⁷¹ Six other serious incidents, which led to a dozen victims (dead and wounded), occurred before the disaster. Some of these events were in connection with the MIC.

Keswani became a modern-day Cassandra. His articles gave rise to indifference and at worst to denial. Thus, the Madhya Pradesh State Minister of Labour said: *"There is no reason to worry about the presence of Carbide because the phosgene it makes is not a toxic gas"* (Lapierre and Moro, 2001, p. 266-269).

Bored by the attitude of his fellow citizens, the journalist left Bhopal shortly after, but before the tragedy of December 1984.

11.4.1.4 A Conscientious Operations and Safety Director

On 5 October 1999, two trains on the same track collided head-on at the Ladbroke Grove Junction a few kilometres west of Paddington Station, London. The accident cost 31 lives and injured more than 400 people.

A Public Inquiry was launched after the accident. The Investigation Commission chaired by Lord Cullen conducted a detailed and thorough analysis of the event. The immediate and direct cause of the accident was a signal (SN 109) passed when it was red. It brought to light that beyond the direct cause, the accident was rooted in the shortcomings of organisation and poor management of safety in this railway sector (Cullen, 2000).

The investigation showed in particular that the SN 109 signal had been passed eight times when it was red in the six years preceding the accident⁷². During this same period, 46 cases of signal passed at red were recorded in the railway zone of the accident.

The Commission of Inquiry noted the existence of a whistle-blower in the person of Mrs. Forster. She was the Operations and Safety Director of the rail company operating at Paddington. In February 1998, a train of her company passed the SN 109 signal when it was red. She was informed that a train from another company had also passed the same red signal in early August.

This information worried her. So, she wrote at the end of August 1998 to the chairman of a working group in charge of proposals for improvements in signal safety. She shared her concerns about the SN 109 signal and she asked what action could be taken *"to mitigate against this high-risk signal?"* In view of the dilatory

⁷² It means that with this single signal, there is an annual risk of collision of 7.2%, that is to say, the risk of a collision every 14 years. It seems that, sometimes, even "scientific" data are not enough for an organisation to make the (right) decisions!

response of the chairman⁷³ and his move to another position, she wrote to his successor to reiterate her concerns about *“a serious problem with drivers misreading signals”* in the Ladbroke Grove zone. The new chairman promised her *“a full risk assessment”* through a future study that a consulting firm would have to carry out. No contract was ever signed on the subject and the “new” chairman of the working group left office. Mrs. Foster wrote again to the third chairman four months before the accident. Her letter remained unanswered, the addressee confessing after the accident that *“he was not aware of the remit which had been given”* to the working group (Cullen, 2000, p. 117-118).

11.4.1.5 A Seismologist Warning about Tsunami

On 11 March 2011, a powerful earthquake struck Japan, triggering a tsunami and a nuclear accident. It was an earthquake with a magnitude of 9.0 on the Richter scale. The tsunami, with waves more than 10 meters, impacted a wide area of the Japanese north-eastern coast. It caused huge damage to buildings and infrastructure. The earthquake and tsunami caused great loss of life and widespread devastation in Japan. As of May 11, 2011, the death toll of the earthquake and tsunami is 14,981 dead and about 9,850 disappeared according to the Japanese police. Three months after the disaster, there were 23,500 dead and missing, with no hope of finding missing survivors.

The tsunami specially impacted 3 NPPs: From north cost to south, it was Onagawa NPP (3 reactors), Fukushima Daini NPP (4 reactors) and Fukushima Daiichi NPP (6 reactors). The anti-tsunami seawall of Fukushima Daiichi NPP (called Fukushima in the rest of the section) was 10 meters high, with about 6 meters above the sea level. The 15 meters high waves of the tsunami submerged the seawall. Waves flooded and totally destroyed the emergency diesel generators and every other power generation systems of the plant. The loss of electricity led to an insufficient cooling of the reactors and nuclear meltdowns in Units 1, 2, and 3 (from 12 March to 15 March). Loss of cooling also caused the pool for storing spent fuel from Reactor 4 to overheat (15 March). It is difficult to assess consequences of the nuclear disaster. Indeed, ionizing radiations and life of radioactive elements are a very slow decaying process that may take decades and centuries.

⁷³ *“I have commissioned a special study to determine what causes can be identified which contribute... I expect a report in the near future and this will ensure that effective solutions are identified for early implementation...” However, no such report was ever produced.*

In 2009, the NISA⁷⁴ held meetings with panel of experts to discuss the safety needs of the Japanese NPPs. During the meetings, issue of tsunamis was never on the agenda. In 2007, an earthquake with a magnitude of 6.6 impacted the west cost of Japan. It caused radioactive leaks at Kashiwazaki-Kariwa NPP, owned and operated by TEPCO⁷⁵, as Fukushima, and water from a pool of nuclear wastes entered the Sea of Japan. When case of Fukushima NPP was addressed, the panel focused on earthquake. Dr Yukinobu Okamura, a respected seismologist, was invited to a meeting in order to present his findings. It was concerned because NISA did not see tsunamis as likely enough to be considered in the Fukushima area. Data used for preventing effect of earthquake were taken from the largest earthquake recorded in 1938 with a magnitude of 7.9. It caused a small tsunami and TEPCO had built a seawall able to stop this kind of tsunami. Okamura explained to the panel that this earthquake was not the biggest. An earthquake that occurred in year 869 was more important and Okamura did not understand why it was not mentioned. The TEPCO representative said that it did not cause much damage. Okamura disagreed and said that damage had been severe. Discussion were focus on earthquakes, not on tsunamis. Furthermore, for TEPCO the earthquake occurred in 869 was simply “historical” without certified data. Eventually, the safety report for Fukushima was approved. It did not consider the 869 earthquakes in model used for updating Fukushima safety guidelines (Clarke and Eddy, 2017).

We note that Okamura was not the only person raising concerns. For instance, a geologist, Masanobu Shishikura told the government before the Fukushima disaster, that north-eastern Japan was overdue for a huge wave (McKie, 2011).

11.4.2 Whistle blowing in the military

In the maritime and aviation sector, based on a long military tradition, operational feedback on safety matters to top management was established as a distributed and delegated responsibility of the captain and his officers. Such feedback covers both the individual level of Good Seamanship and Good Airmanship and the institutional level of legal disciplinary actions by a Maritime Court in case of misconduct. Social sciences have elaborated this good operatorship concept into High Reliable Organisations, while the Maritime Court concept evolved into

⁷⁴ Nuclear and Industrial Safety Agency, the Japanese Safety Authorities.

⁷⁵ Tokyo Electric Power Company.

independent safety investigation agencies. Such operational feedback can be both prospective and retrospective.

11.4.2.1 The Joe Kennedy air crash: a prospective case

On August 12th 1944, a thunderous explosion destroyed a B-24 Liberator over the coast of England on its way to its targets in France, the underground Fortress of Mimoyecques launching sites of the German V3 missiles. The B-24 was part of Operation Aphrodite, equipped as a drone; a massive flying bomb with rudimentary control equipment for guiding the drone to its target. The pilots were supposed to bail out after bringing the aircraft up to 2000 feet where it was supported further along to its target by another aircraft. Several minutes short of the planned bailout, an electrical fault in the wiring harness of the warning device of the Liberator caused the 21,170 pounds of Torpex to detonate. The massive explosion dispersed the aircraft and the two airmen on board; Joseph Kennedy – the older brother of John F. Kennedy – and Wilford Willy. The shockwave almost brought down the trailing Mosquito flying 300 feet above and about 300 yards to the rear of the robot. The photographer on this aircraft was injured and the aircraft was damaged slightly by the explosion. The aircraft belonged to a unit under the command of the son of President Roosevelt who claimed to be aboard this trailing aircraft.

An electronics officer, Earl Olsen, who believed the wiring harness had a design defect, had warned Kennedy of this possibility the day before the mission. The electronics officer implored the 29-year-old pilot and veteran of 25 combat missions not to go on this one. He discovered a fault in the remote-control arming device aboard his aircraft. He warned Kennedy's Chief Officer to no avail. Olsen pleaded to call off the flight, but was ignored. Since hearing about John's exploits in the South Pacific, Joseph badly wanted to top his brother heroics. While John's patrol boat sunk by a Japanese destroyer, he led the 10 survivors to an island where they were eventually rescued. John received the Navy Cross for his actions and was celebrated as a genuine war hero. It started his political career and run for Presidency. Operation Aphrodite was a complete disaster. Of more than a dozen missions, only one plane caused damage to the target, and only because it

crashed somewhat close. In September 1944, Canadian troops raided the V-3 base and found it abandoned since July (Wikipedia 1).

11.4.2.2 The Aerolinee Itavia air crash: a retrospective case

On June 1980, an inexplicable explosion destroyed an Italian DC-9 aircraft of Aerolinee Itavia, flight 870. It crashed into the Tyrrhenian Sea near Ustica. All 77 passengers and 4 crew members perished. The crash remained a source of conspiracy for many years with reports that contradicted each other. Only on December 20th 2017, a former US military, Brian Sandler, felt confident after 37 years to speak up in public about the crash (Telegraaf 2017). Sandler recalled a return to the US aircraft carrier Saratoga of two Phantom jets without their air-to-air missiles, because they had shot down two Libyan MIG jets that had approached them aggressively. The DC-9 had been hit accidentally during the interception, but the American attack had been denied until his revelation, 37 years later.

11.4.3 Note on the Role of Whistle-Blowers in Industry

The role and importance of whistle-blowers in the domain of safety is not yet fully acknowledged⁷⁶. For instance, Rajkumar Keswani (see § 11.4.1.3) is not cited in the accident analysis seen as a reference by scholars (Shrivastava, 1992). His action is “only” described in a general audience book (Lapierre and Moro, 2001). You could not find the name of Dan Applegate (see § 11.4.1.2) in the official accident report (Secrétariat d'État aux Transports, 1976): to know the existence of his warning, you must read a book written by journalists (Eddy et al., 1976). The same story has happened to the alert launched by Carlyle Michelson (see § 11.5): it is expressed in a technical report drafted for the NRC (Rogovin and Frampton, 1980) and not in the “official” report of the President's Commission on the accident (Kemeny et al., 1979).

We have also to note that it is difficult to find documentation in scientific literature about cases for which a warning was successfully listened and treated.

Taking whistleblowing into account does not belong to a statistical or probabilistic paradigm. Event occurrence and whistle-blowers belong to the domain of “outliers of the curve” treatment. It takes effort to dig as deep as possible during an event

⁷⁶ One reason could be because event reports are anonymous (people are not named), disembodied. In numerous reports, not to say the largest majority, it seems that there is no human being with flesh and blood present at the time of the event! (see Llory, 1996).

analysis to highlight the existence of whistle-blower(s). We assume that the game is worth the candle because events would be analysed in a more systematic way and it would allow us to define more precisely features or alerts of whistle-blowers.

National, monetary, corporate or military vested interests may obstruct a timely transparency in precursors and causes of accidents, preventing further analysis, research and development. An exception exists in the aviation industry, where Good Airmanship and High Reliable Organisations were created to institutionalize timely operational feedback without fear of retaliation or exclusion of the messenger (McCall 2017).

11.4.4 Whistle-Blowers in Civil Society

11.4.4.1 The "First" Whistle-Blower

To be whistle-blower should it be in our DNA? Can we educate ourselves in this direction? Should it be a civil obligation? Is it something good or bad to be a whistle-blower? What or who should determine us to become a whistle-blower? Is it a matter of courage? What risks can we assume?

After a decade since the end of the Second World War and practically the beginning of the "Cold War", more precisely on November 1, 1955, an armed conflict started in South East of Asia, in Indochina Peninsula. This is known as the "Vietnam War" or the "Second Indochina War". People from Vietnam, called it the "War of Resistance Against America". It is still known as the "American War" and in fact, it was a fight against the two parts of Vietnam, North and South. The army of North Vietnam (The Democratic Republic of Vietnam) was supported by the Soviet Union, China and other communist allies, and the army from South Vietnam (The Vietnam Republic) was supported by the United States, South Korea, Australia and other anti-Communist allies (Wikipedia 3, undated).

The period in which this war occurred, until April 30, 1975⁷⁷, was an extremely difficult one for the four successive Presidents. The whole period was characterized by big protests organised by anti-war associations and most of the Americans considered that the war was "unjustified", indefensible (Ely, 1990).

⁷⁷ Fall of Saigon, the capital of South Vietnam. This event marks the end of the Vietnam War.

At the end of the 60s, the US Secretary of Defence, Robert McNamara, set up a Commission for drafting a realistic analysis about Vietnam situation ("a study"). Goal was to have an "encyclopaedic history of the Vietnam War". According to his point of view, this report, officially entitled "History of U.S. Decision-making in Vietnam, 1945-1968". He believed, he later said, that a written record of the key decisions that led to the U.S. involvement in Vietnam would be of great value to scholars. (Linder, 2011).

The Commission, was composed of specialists from the Pentagon, the State Department, academics and some "think tanks", such as RAND Corporation⁷⁸ (Wikipedia 4, undated). They had access to many documents and records, from the White House, the Secretary of Defence personal notes and from the CIA.

The study was finished by the beginning of 1969. The result of this work, 7000 pages contained in 47 volumes, showed that the USA was involved in that war by the Truman administration, which decided to offer military support to France in its colonial war against the Viet Minh. Also, the analysis revealed that the next three administrations (Eisenhower, Kennedy, Johnson), have intensified the war and made decisions which were hidden to the American people or which had, at that time, negative observations from the "US Intelligence Community" such as "the bombing of North Vietnam in 1965" (Encyclopaedia Britannica, undated).

Although, the study could have been a historical study, considering the disclosures made, the it was classified "Top Secret" by the Pentagon and only fifteen copies were published. The authorities "were worried" about the possible negative consequences if the public came to know about the whole output. (Linder, 2011).

Daniel Ellsberg was one member of the Commission. He was a strategic analyst at the RAND Corporation. In 1954, he enlisted in the U.S. Marine Corps and served in the army for three years. From his point of view, the study showed that the United States faced a difficult choice between "the bad and the worst" ". He was not optimistic regarding a victory of his country in Vietnam. (Linder, 2011).

In August 1969, Daniel Ellsberg met Randy Kehler, an opponent of the war, on a meeting of the "War Resisters International" (an international anti-war organisation) organized by the Haverford College. Kehler's speech, in which he showed his availability to go to prison (finally, he was charged with a federal

⁷⁸ RAND Corporation is an American non-profit global policy think tank created in 1948 by the Douglas Aircraft Company.

crime") to fight against the war, impressed him and was an important event for his future decision (Wikipedia 4 & 5, undated).

In this context, considering that this war had done enough victims for all parts involved, and probably it would never stop, after Kehler's conference, he decided to do something, assumed any risk, including his act being considered as a crime and to be punished for that.

At the end of September 1969, he decided to copy that report and to give it to the press. In 13 of June 1971, the New York Times published parts of this study. (Encyclopaedia Britannica, undated)

The Washington Post and another 18 publications, did the same. They called them the "Pentagon Papers".

On June 28, 1971, Ellsberg publicly surrendered to the United States Attorney's Office in Boston. He admitting to have given the documents to the press.

He faced charges under the Espionage Act of 1917 and other charges including theft and conspiracy, carrying a total maximum sentence of 115 years. The trial began in Los Angeles on January 1973. Ellsberg tried to claim that the documents were illegally classified to keep them not from an enemy but from the American public. However, that argument was ruled "irrelevant". Ellsberg was silenced before he could begin.

In spite of being effectively denied a defence, Ellsberg began to see events turn in his favour when the break-in of Fielding's office was revealed to the Judge Byrne.

On May 9, further evidence of illegal wiretapping against Ellsberg by the FBI was revealed in court. Furthermore, the prosecution had failed to share this evidence with the defence

Due to the gross governmental misconduct and illegal evidence gathering, Judge the Judge dismissed all charges against Ellsberg on May 11, 1973 after the government claimed it had lost records of wiretapping against Ellsberg.

⁷⁹ In 1969, Vietnam veteran Ron Ridenhour wrote a letter to Congress and the Pentagon describing the horrific events at My Lai – the infamous massacre of the Vietnam War – bringing the scandal to the attention of the American public and the world.

⁸⁰ Olaf Palme was a former Prime Minister of Sweden, assassinated in 1986 while he was in office. The crime remains unsolved.

Ellsberg's action led to a decrease in confidence from the American people in the government, reducing also the influence capacity of the American authorities in that region. Finally, the war finished in April 1975, after the fall of Saigon (Wikipedia 4, undated).

Daniel Ellsberg is recipient of the inaugural Ridenhour⁷⁹ Courage Prize as well as the Gandhi Peace Award, the Right Livelihood Award, the Dresden Peace Prize, and the Olof Palme⁸⁰ Prize.

Daniel Ellsberg became an anti-war activist (against US-led war in Iraq, against US military action against Iran, ...). He is also a support for American whistle-blowers (he says that the existence of WikiLeaks⁸¹ helps to build a better government, he is taking part in demonstrations against Manning's incarceration⁸², ...) (Wikipedia 4, undated).

He is also concerned be nuclear weapons. For him: "*As long as the world maintains large nuclear arsenals, it is not a matter of if, but when, a nuclear war will occur*". (Canfield, 2017)

11.4.4.2 A Physician with a Global Vision

Irène Frachon is a French pulmonologist, posted at the Brest hospital since 1996. She developed a support activity for people suffering from arterial pulmonary hypertension. During early 1990s, as young doctor she trained in a unit of a hospital in (the suburb of) Paris. This unit was specialised in pulmonary arterial hypertension and was recently receiving and treating a number of young women with a lethal very high pulmonary hypertension. This disease was related to the consumption of the drug Isomeride® (which is an "appetite suppressant") for 20% and later for 30% of them. Isomeride®, manufactured by Servier laboratories, was commercially marketed in the 1980s and was withdrawn from the market in the late 1990s due to serious side effects, including heart valve disease and pulmonary arterial hypertension.

⁸¹ International non-profit organisation, founded by Julian Assange, that publishes classified media provided by anonymous sources.

⁸² Chelsea Manning was an intelligence analyst assigned in 2009 to an Army unit in Iraq who disclosed to WikiLeaks about 750,000 classified, or unclassified but sensitive, military and diplomatic documents.

In June 2006, Dr Frachon reads in a medical journal an article criticising the retention of a drug marketed since 1976 under the name of Mediator®⁸³. Manufactured also by the Servier Laboratories, it should be prescribed for cases of non-insulin-dependent diabetes. Nevertheless, it is widely distributed in France⁸⁴, because it is prescribed and used as an "appetite suppressant" with recommendation as a simple adjunct to a diabetic diet. Mediator® is a drug of the same family as Isomeride®⁸⁵. They are amphetamine derivatives.

In February 2007, she received a patient with an unusual pulmonary arterial hypertension. Looking at her prescription, she realised that the patient has been on Mediator® for several years. She then contacted her former Parisian colleagues who tell her that they do not know what to do because they have only a few observations. Together, they decided to report the facts at Afssaps (the French Health and Safety Authority for Health Products): it is a pharmacovigilance declaration. They also decided to make a scientific communication about the cases they will gather. But it would be complicated because there are not many cases, and it will be a little tricky and to attribute causes. Furthermore, they start to get a little scared because Servier laboratories are known for their legalism, bullying, and lobbying. So, she looked for accurate and detailed information about Mediator® in order not to get into trouble with laboratories (in case of wrong information or error). Laboratories explained that there was no relationship between Mediator® and Isomeride®, for both the chemical structure and the metabolic pathway. Actually, the molecules are not the same, but, according to Dr Frachon, to say that there is no chemical resemblance between the two is "to be in bad faith". Norfenfluramine is the active ingredient ("appetite suppressant") of one and the other of these products.

Throughout the years 2007-2008 Dr Frachon led an informal team that she set up. It was made of some cardiologists with whom she worked in the frame of arterial pulmonary hypertension studies. They alerted her to cases of valvopathy for patients who took Mediator®. Dr. Frachon doubted about pure coincidence. This opinion was shared by her colleagues in the hospital's IT department. In parallel that she goes to see in order to get the list of patients suffering from valvopathies

⁸³ The Mediator® was initially prescribed as part of a treatment for diabetes before being recommended for weight loss (although it was not an "official" appetite suppressant).

⁸⁴ From 1976 to 2010, the Mediator® was a top selling drug: bought by at least 2 million consumers and with 7 million boxes sold per year. Main (most serious) pathology linked to the Mediator® are valvopathies for some people (and only those people).

and thus exploit epidemiological statistics. Relationships appear between valvopathies and Mediator® intake.

In October 2008 and February 2009, she made two scientific papers about this issue at conferences. These communications did not receive a considerable echo.

Then a report of 15 cases is sent to Afssaps. The report is accompanied by an email saying, "*We are very worried, very concerned about these valvopathies*". The team was received for the first time by Afssaps on June 3, 2009. During the meeting, the team presented everything they have gathered with photos of the valvopathies. It also compares with the 1998 American dossier about Isomeride®, that shows the same pathologies. It also presents a dossier of a Spanish case in 2003: a patient who, under Mediator® had a very retracted valve. The Spaniards sounded an alarm by saying that they saw valvopathies under Mediator® as under Isomeride®⁸⁶. So, the results of the study are shown to Afssaps committees. The committee members said: "This is very good, but we will have to do additional studies beforehand to confirm this causal link, we do not withdraw a Marketing Authorisation like this". Therefore, the team sets up a case-control epidemiological study. It consists in taking into account all the valvopathies leading to insufficiencies and requiring hospitalization at the Brest hospital from 2003. Then the unexplained valvopathies were isolated, assuming that it is among them that there is the best chance of finding this causal factor. Then the patients were questioned extremely rigorously to know if they had been exposed to the Mediator®, their surgeon was also interviewed, and their medical file was compared with patients who had valvopathies for commonly known causes. The team realises that it was 70% exposure to Mediator® (unexplained valvopathies) compared to 6% (valvopathies for known causes). These results are shown, during an in-camera meeting in September 4, 2009 to Afssaps management, which rushed ... to criticise thoroughly the study because of – supposedly - bias in the study. The study is presented to Afssaps dedicated committee on September 29, and the study worries the experts of Afssaps. It is noted that results of another study are added to the first results. This second study was collected thanks to the

⁸⁵ While drugs from the amphetamine family have been withdrawn from the market two years after the Isomeride® ban, the Mediator® is not concerned since it is not officially an appetite suppressant.

⁸⁶ Servier laboratories immediately withdrew its drug from Spain (probably so that the noise does not come to France !!). But they did not remove it from France.

“arterial pulmonary hypertension network” that Dr Frachon activated during the month (Frachon, 2010; Bensadon et al., 2011; Hermange, 2011).

On September 29, 2009, based on these two studies, Afssaps voted that it is not possible to leave patients exposed to this risk. The effective withdrawal is decided to be effective on November 30, 2009.

Dr Frachon realises that there will be no information for public about the reasons of the drug withdrawal. As victims who will never be fully informed, it will make difficult for them to file a lawsuit in front of the Servier laboratories in order to obtain recognition of their responsibility and then compensation. She decided to write a book with the goal to have a document that was not too big, accessible and extremely well documented. The book was published in June 2010 with the title “Mediator 150 mg” and subtitle “How many deaths?”. The censorship of the subtitle is ordered right after its released by a court at the request of the Servier laboratories. In January 2011, a judgement by a Court of Appeal annulled the censorship of the title of the book.

Regarding medical consequences of the scandal of Mediator®, at first, Afssaps advanced the figure of 500 deaths minimum. A latest forensic expertise on the subject estimates that between 1,500 and 2,100 people died of the adverse effect of this drug.

In 2011, Irène Frachon received a “Citizens Whistle-Blower” trophy award from an NGO whose role is to rehabilitate representative democracy, to promote ethics in politics, to fight against corruption and tax evasion.

Finally, the Servier Laboratories and the “National Agency for Drug Security”⁸⁷ are being sent to the correctional court for the Mediator case, on September 2017. They are charged respectively for “aggravated deception, fraud, injury and manslaughter and trading in influence” and “Injury and manslaughter”.

⁸⁷ New name for the Afssaps (which was reorganised after the Mediator® scandal).

⁸⁸ Laura Poitras is a director, documentary producer, journalist and American photographer. Her 2014 movie about Snowden history (Citizenfour was awarded the Oscar for Best Documentary in 2015).

11.4.4.3 A Citizen Sensitive to the Protection of Privacy

Edward Snowden is an American computer scientist who revealed the details of several US mass surveillance programs.

In 2006, Edward Snowden was hired by the Central Intelligence Agency (CIA) as a computer engineer to maintain the computer system’s network security, having a top-secret security clearance. In 2009, he resigned from the CIA and is, then, hired as a contractor by Dell. He is assigned to National Security Agency (NSA) facilities (in Japan and in Hawaii). While he was working in Hawaii, he copies on a USB stick ultra-confidential information. In January 2013, he contacts Laura Poitras⁸⁸ and Glenn Greenwald⁸⁹ anonymously.

Edward Snowden fled to Hong Kong in May 2013. In June he flew to Moscow where he was granted temporary asylum in July⁹⁰. In January 2017, his asylum was renewed for three more years

In June 2013, the British newspaper “*The Guardian*” started publishing some the revelations. Then, many newspapers from all over the world published leaks originally provided by Snowden.

The volume of documents transmitted is a controversial issue. According to different sources it is between 15,000 and 20,000; another estimate goes up to 1,7 million.

Snowden's leaks revealed, among other things, that:

- there were many NSA programs for mass surveillance of telephone calls and online exchanges;
- many foreign leaders are wiretapped;
- many data on “ordinary” American citizens were collected;
- although focused on surveillance for an anti-terrorist purpose, the NSA was also involved in economic and industrial espionage.

The US government indicted Snowden on three charges: theft of government property, unauthorised communication of national defence information and wilful

⁸⁹ Glenn Greenwald is a political journalist, lawyer, blogger and American writer.

⁹⁰ In the meantime, he had applied for asylum in twenty-one countries.

communication of classified intelligence to an unauthorised person: the last two charges fall under the 1917 Espionage Act (Burrough et al., 2014; Lefébure, 2014).

11.4.4.4 The Panama Papers: Action of An Anonymous Whistle-Blower

Panama Papers report, in August 2015, the leak of more than 11.5 million confidential documents from the Panamanian law firm Mossack Fonseca, detailing information on more than 214,000 offshore companies and the names of the shareholders of these companies. Among them are politicians, billionaires, top athletes or celebrities and even mobsters and smugglers.

The documents were provided by an anonymous and unpaid whistle-blower (known only under the pseudonym of "John Doe"). "John Doe" chose to send information to Bastian Obermayer, a reporter from "Süddeutsche Zeitung", a German newspaper. The Süddeutsche Zeitung decided to analyse the data in cooperation with the International Consortium of Investigative Journalists (ICIJ)⁹¹. When "John Doe" contacted the Süddeutsche Zeitung, he put a couple of conditions for providing the information because he considered that, doing that, he put his life in danger:

- to chat only over encrypted files;
- no meeting, ever.

"John Doe" said that reasons why he leaked information was to make "*these crimes public*".

Volume of data leaked was approximately 2,6 Terabits – more than the combined total of the Wikileaks Cablegate⁹², Offshore Leaks⁹³, Lux Leaks⁹⁴, and Swiss Leaks⁹⁵. The data primarily comprises e-mails, pdf files, photo files, and excerpts of an internal Mossack Fonseca database. It covers a period spanning from the 1970s to

⁹¹ ICIJ is an international network launched in 1997 by the Center for Public Integrity (non-profit investigative journalism organization). ICIJ was spun off in February 2017 into a fully independent organisation which includes more than 200 investigative journalists and 100 media organizations in over 70 countries (Wikipedia)

⁹² In 2010, leak of 251287 diplomatic telegrams which were exchanged between nearly 300 embassies since 1966 (1.7 gigabytes of data).

⁹³ Name of an ICIJ report disclosing details of 130,000 offshore accounts in April 2013. It was seen as the biggest hit against international tax fraud of all times.

⁹⁴ Financial scandal revealing the content of several hundred very advantageous tax agreements concluded with the Luxembourg tax authorities by audit firms on behalf of many international clients such as multinational corporations Apple, Amazon, Heinz, Pepsi, Ikea and Deutsche Bank. The scandal is revealed in November 2014 following investigations by the ICIJ. The judicial aspect of the scandal

the spring of 2016.

On 3 April, 2016, 109 newspapers, TV and online channels, published simultaneously, in 76 countries, first conclusions to inform about schemes used by Mossack Fonseca clients for hiding for money in some tax havens, for tax evasion and for money laundering. (Obermayer and Obermaier, 2016; 2017).

Because all these people and actions seems to have connections with the law office Mossack Fonseca from Panama, this investigation was called "Panama Papers" in reference to the "Pentagon Papers", and is probably, as Edward Snowden said, "*the biggest leak in the history of data journalism*" (on Twitter, April 3, 2016).

11.4.4.5 Social Media and Whistle-Blowing

The emergence of social networks (Facebook, Twitter, YouTube, Instagram, ...) has changed the game in allowing to dissemination of information in real time on a large scale, thus bringing an audience to many citizens who claim themselves as whistle-blowers. In that case, social networks can be important relays for an alert receives a significant audience. For instance, in 2017, when an interim truck driver posted a video on YouTube showing that an iron and steel company spilling acid in a slag near the plant⁹⁶, he did not suspect for a moment that the images would become viral, be seen by millions of people, and thus trigger an environmental scandal⁹⁷.

So far, the alert launching and the warning role of the general public was rather played by a single person expert in a specific domain or by consumer or environmental organizations, as well as unions and journalists. But the current atmosphere of mistrust between people and "official institutions" has not spared

concerns people prosecuted by the Luxembourg courts for leaking documents and which resulted in 2016 in the conviction of the two whistle-blowers.

⁹⁵ Disclosure in 2015 of a giant tax evasion scheme operated with the knowledge and encouragement of the British multinational bank HSBC via its Swiss subsidiary. Disclosure has been triggered by leaked information from a computer analyst Hervé Falciani on accounts held by over 100,000 clients and 20,000 offshore companies with HSBC in Geneva.

⁹⁶ Liquid spilt was not iron mud, as indicated by the delivery notes, but "used acid". The cargo should instead be driven to a suitable recycling centre, an hour and a half far from the plant. A longer and much more expensive procedure.

⁹⁷ The truck driver was fired for "breach of commercial discretion". Since then, he has not been able to find another job.

intermediate bodies. This phenomenon, associated with the development of social networks that allows all citizens to speak without intermediary, marks a break and explains the proliferation of ordinary committed citizens who behave as whistle-blowers, eager to engage themselves.

Social networks have taken up a lot of space today. It is an important relay so that an alert could receive a large audience. Being a whistle-blower leads to a kind of authenticity label for many causes, meaning that case/information provided is relevant and important.

In the past, the tools used by citizens to express themselves implied the use of traditional media, for example by being interviewed by journalists. Today, social networks can transmit information in real time, as evidenced by the many movies posted live by users on Twitter. The "traditional" media then intervene in a second phase, taking up some information to increase its visibility.

Citizens becoming whistle-blower take risks, which can put their lives in danger. Thus, Daphné Caruana Galizia, a Maltese journalist, columnist for several media and editor of a popular blog, denounced the corruption that ruled in Malta among politicians of all political parties, up to members of the Government. She was murdered in October 2017, in the explosion of her car, under which a bomb was put.

On the other hand, is denouncing an abuse or a danger on the web enough to make you a whistle-blower? Social networks have brought a lot of confusion up to misinformation. So, the Cambridge Analytica scandal showed that Facebook has decisively influenced the results of the US presidential election in 2016 and on the result of the referendum on Brexit in Great Britain in 2016 (Lewis and Hilder, 2018; Szadkowski, 2019).

11.4.4.6 Crisis Situation and Whistle-blowing

We have just seen that being a whistle-blower is not an easy position whether in a business or in civil society. One might think that this is partly due to the fact that

he/she warns of a hypothetical event for which the possibility of occurrence is difficult for others to comprehend. Do crisis situations restore the role of whistle-blower in giving it back the place it deserves? In other words, in a crisis situation, the dreaded event (the threat) has occurred. Therefore, the question is no longer whether the alert is relevant but to appreciate if the perception of the danger linked to the consequences is shared.

In December 2019, an outbreak due to the coronavirus covid-19 started in the Wuhan region of China. It quickly turned into a global pandemic leading to more than 2 million people infected and the death of more than 160,000 people worldwide⁹⁸. This crisis gave the opportunity to see on the one hand a few whistle-blowers appear and in the other hand the behaviour of decision makers (Bodet and Chaverou, 2020; Johnson, 2020; Gafni and Garofoli, 2020):

- On December 30, 2019, Li Wenliang shared with former medical students, on a social network, the report sent by Doctor Ai Fen⁹⁹. Two days later, in the middle of the night, he was arrested with seven other doctors for "spreading rumours" and "seriously disrupting social order". Questioned for several hours, he was forced to sign a letter of reprimand for spreading rumours on the internet. He must promise not to commit "acts contrary to the law". Only then is he allowed to return to work. On January 10, Li Wenliang cares for a patient with glaucoma, without knowing that she is infected with the coronavirus. He tested positive on February 1. Hospitalized two days later, he was transferred to an intensive care unit and placed on respiratory assistance. On February 6, Chinese national television CCTV and the daily newspaper Global Times announced his death, before removing this information from social networks following the denial of the Wuhan central hospital. A few hours later, the establishment confirmed his death¹⁰⁰;
- On March 25, 2020, Sergei Satsouk, editor of the online daily Ejednevnik in Belarus, was arrested and charged with "corruption", a crime punishable by ten years in prison. Three days earlier, Ejednevnik, well

⁹⁸ Data from April 2020, paragraph writing period. At the end of the crisis, the figures will be much more significant.

⁹⁹ She is seen as the first whistle-blower regarding covid-19.

¹⁰⁰ Authorities are accused, on social media, of delaying the announcement of his death. Some criticize the Chinese government for covering the scale of the outbreak and demand more freedom of expression. On March 19, an official Chinese investigation disavowed the Wuhan police for having reprimanded Li

Wenliang and his seven colleagues. In late January, the Supreme Court had already rehabilitated Doctor Li and other whistle-blowers in an article published in the press. Li Wenliang is now a national hero for part of the Chinese population for alerting colleagues when the virus first appeared, while the authorities sought to stifle his revelations. He was 34 years old. He and his wife were expecting their second child

knowns for its inquiries about the country's health care system, published an editorial questioning official statistic on the Covid-19 outbreak. The article also criticizes President Lukashenko's order to "deal with" the media covering the epidemic;

- Ruth Michaelson, a journalist with the British daily The Guardian, has worked in Egypt since 2014. On Sunday, March 15, 2020, she reported in the newspaper on research by infectious disease specialists from the University of Toronto, as well as public health and information reports that indicate that Egypt is much more affected by the coronavirus than the government says. The day after publication, the journalist is summoned for three and a half hours by the Egyptian State Information Service. On March 17, Ruth Michaelson lost her accreditation. She was expelled from the country three days later. In Egypt, the government has stepped up censorship, officially to fight "fake news"¹⁰¹;
- Ana Lalić, journalist for the Nova.rs news site in Serbia, publishes an article about the hospital in Novi Sad, in northern Serbia. Its title: "Voivodine clinical centre at the breaking point, no protection for nurses". Ana Lalić describes there "a chronic shortage of basic equipment" and "chaotic" working conditions. On condition of anonymity, a doctor said that "the nurses rebelled and refused to enter the patients' rooms because there was no protective equipment". The article states that employees of the emergency centre and the intensive care unit, including those in the operating rooms, are only entitled to one protective mask per day. The hospital denied this information and filed a complaint against Ana Lalić for defamation, shouting her "indignation at the inaccurate, unverified and malicious reports" of Nova.rs. The day after her article, Ana Lalić is arrested by six police officers who search her apartment from top to bottom, seize her computer and mobile phone and make her undergo two hearings;
- In Great Britain, draconian measures were decided/applied in order to prevent some healthcare professionals discussing their work during covid-19 outbreak. Healthcare professionals are being silenced and

threatened with disciplinary action for speaking out about their work during the coronavirus outbreak. Healthcare professionals are being silenced and threatened with disciplinary action for speaking out about their work during the coronavirus outbreak. Workers who have spoken to the journalists say they fear being disciplined. Several professionals said they worried about losing their jobs. Examples include an email signed by the chief executive of one NHS (National Health Service) trust forbidding all staff from talking to the media. In some cases, staff suspect emails and social media accounts are being monitored. Many NHS staff are increasingly concerned that their ability to share stories about their work is being restricted by a clampdown on speaking out publicly. It follows reports of doctors and nurses being gagged by hospitals and other NHS bodies from speaking out about widespread shortages of personal protective equipment. It has included threatening emails, the possibility of disciplinary action, and some people even being sent home from work. f suspect emails and social media accounts are being monitored;

- Brett Crozier, the commander of the American nuclear aircraft carrier Theodore Roosevelt, can be seen as the whistle-blower's symbol in the US Navy. It all started on March 30. After a stopover in Guam, Brett Crozier alerted his hierarchy about the meteoric progression of the disease on board the ship: a hundred men were affected out of nearly 5,000 crew members. "This will require a political solution but it is the right thing to do", Crozier wrote. "We are not at war. Sailors do not need to die. If we do not act now, we are failing to properly take care of our most trusted asset — our Sailors." Crozier also said that only a small contingent of infected sailors have been off-boarded. Most of the crew remain aboard the ship, where following official guidelines for 14-day quarantines and social distancing is impossible. Due to a warship's inherent limitations of space, we are not doing this," Crozier wrote. "The spread of the disease is ongoing and accelerating." Eventually, he requested "compliant quarantine rooms" on shore in Guam for his entire crew "as soon as possible". Few days later, acting secretary of the US

¹⁰¹ Other cases of police violence against journalists in Africa are reported: for instance, Tholi Totali Glody, journalist in the Democratic Republic of Congo is responsible for covering the confinement in the province of High-Katanga. The journalist was arrested by two police officers, who chased him and struck him voluntarily. He suffered a broken leg and injuries to the face and arm. In Mali and the Congo, a

journalist and a television crew were briefly arrested following reports of the outbreak. For having revealed two cases of coronavirus in Abidjan prison in an investigation whose conclusions were denied by the prison administration, two Ivorian journalists were sentenced to a fine of 5 million CFA francs (7,622 euros) each for "Spreading fake news" ...

Navy, Thomas Modly, announced that captain Brett Crozier was relieved of his command of the USS Theodore Roosevelt, stationed in the Pacific, for showing “extremely poor judgment” by widely disseminating a memo about the coronavirus infection spreading quickly on the vessel with 4,800 crew members. Thomas Modly accused Crozier of “misrepresenting the facts” and took him to task for disobeying the chain of command¹⁰². Even the President of the USA, Donald Trump, called the letter a “mistake” that had worried families and showed “weakness”.

All these examples show that even in crisis situations whistle-blowers are rarely listened to or even worse, harassed undergoing censorship attempts to silence them.

We can notice that a crisis situation “favours” the emergence of whistle-blowers - here a worldwide crisis with whistle-blowers in many countries, whatever the political system. We also note the speed at which they disseminate information using massively social networks and the media (presence of journalists playing the role of whistle-blower).

The authorities' reaction is also very rapid and very strong in order to silence the whistle-blowers who are seen as troublemakers. In addition, they have little room for their defence with a lot of cover-ups, administrative decisions or “botched” trials. Whistle-blowers shake the certainties of authorities in power who fear that their authority and decisions will be criticized or called into question. Is it really surprising? Not so much when we keep in mind that whistle-blowers point to system failures (or weaknesses) that only a few people agree to see, and that crisis situations are the moments when these weaknesses become “obvious” (visible).

11.5 Features of Whistle-Blowers and of Whistleblowing in Industry

This chapter has only addressed a few iconic cases. We could have talked more in detail about Carlyle Michelson, a nuclear engineer who worked part-time for the NRC and who took, in 1977, the initiative to study behaviour of the process in case of a small break in a specific location of the reactor primary circuit (top of the

pressurizer). Results were far beyond design (designers) assumptions, yet few people read about them. A reviewer in NRC prepared a memo based on Michelson's concerns and based on a previous incident that occurred at Davis Besse NPP (Ohio). Michelson's study and the memo did not circulate widely because the issue was not identified as a generic safety problem for operating plants. Eventually the memo was filed away (Rogovin, 1980). About one year later, a major accident occurred at the Three Mile Island NPP (Pennsylvania). The scenario was similar to that imagined by Michelson.

We could also have told about the story of Roger Boisjoly, one of the most well-known whistle-blowers in the “history” of industrial safety. He was a mechanical engineer at Morton Thiokol, the manufacturer of the solid rocket boosters for the Space Shuttle program. In July 1985, he wrote a first memo about their weaknesses, arguing that if, unfixed, it could lead to a catastrophe. He wrote several other memos on that matter, but no action was taken. On the eve of the launch of the 25th Space Shuttle flight, on 28 January 1986, he tried with some colleagues to convince the NASA management to postpone the flight because of the cold temperature. They felt that this would jeopardize the safety of the mission, and potentially lose the shuttle. No one listened to them. The Space Shuttle exploded 73 seconds after lift-off, killing the seven astronauts on board (Vaughan, 1996).

Even if the search for whistle-blowers is not yet a major concern of event analysis, we could still provide an outline of whistle-blowers and of whistleblowing features:

- “Whistle-blower lacks a legitimate base of power for making the change” (Near Miceli, 1985, p. 2);
- Whistleblowing deals with degradation of safety and could prevent occurrence of some events;
- Duration of an alert is variable: It can last days, months or years;
- A whistle-blower is either inside or outside the organisation (company / plant), but he / she is always close to the technical aspects of operations;
- The position of a whistle-blower in the organisation could be from the bottom (e.g., a field operator) to the top (e.g., a manager) and expertise.

¹⁰² Eventually, Thomas Modly has resigned, fallout from the ongoing controversy surrounding the Navy's handling of a coronavirus outbreak on the naval ship USS Theodore Roosevelt.

The whistle-blower has the power of influence, but is not a decision-maker regarding the alert launched;

- For informing about the alert, the whistle-blower uses internal channels (within organisation), or (often then) the Safety Authorities, or the media, or NGOs;
- Alerts are technically oriented and safety oriented and they can be repeated, sometimes in different ways;
- Most of the time, alerts are issued by people close to the technical field or having information from field personnel;
- Warnings can be issued before events or can disclose information afterwards that was suppressed before the event.

We have to stress that alerts are not a scientific “expert opinion”, since a whistle-blower is personally involved and ethically committed. Typically, an alert is not a simple denunciation since the alert is developing. This is not a prediction because an alert relates to the symptoms of deterioration of safety.

This first set of features might help to make a difference between alerts and background noise, i.e., to figure out relevant safety alerts among the numerous alerts that are launched.

11.6 Position of the Company Towards Whistle-Blowers in Industry

It seems that very often, companies are not ready to listen to alerts. There are several underlying cultural reasons explaining this “behaviour”. They are summarized by the US CSB¹⁰³ (U.S. CSB, 2007, p.160):

- *“The incentives used in [the] workplace may encourage hiding mistakes.”*
- *“[...] work under pressures that lead us to miss or ignore early indicators of potential problems.”*
- *“Bad news is not encouraged.”*

As we saw, very often, organisations do not listen to whistle-blowers¹⁰⁴. Two apparent reasons that lead to this result are on the one hand the inability to

identify the relevance of alert, and on the other hand, the will not to detect or to identify the alert.

Several tactics to cope with whistle blowing exist:

When an organisation is unable to identify or accept the alert, it will have an attitude of denial in claiming that whistle-blowers are dissatisfied or displeased. The organisation will deny the risk (e.g., Keswani, Okamura) or engage in delaying tactics (e.g., Forster).

When an organisation does not want to acknowledge the significance of an alert, it becomes obstructive in isolating or bullying the whistle-blower (e.g. Galatis).

In every case, the implicit message is that the organisation denies the expertise and competence of the whistle-blowers.

We also note that, in some cases, whistle-blowers are isolated by their colleagues who consider them as “traitors” (e.g. Galatis, Boisjoly). Often, they have to leave the company they were working for. For example, George Galatis worked for the pharmaceutical industry and in the maritime sector after being pushed out of his job. Similarly, Roger Boisjoly resigned from the NASA and became a speaker on workplace ethics.

In recent years, a number of strands of research in the social sciences have emphasized the importance of diversity of viewpoints to effective decision-making, and have identified a number of features of organizational culture that encourage the expression of concerns and their effective management. The more normative recommendations that have emerged from this research are being integrated into management practice in various ways:

- The importance of requisite variety of expertise to learning within organizations, the risks generated by attempts to eliminate divergent opinions and the implications in terms of power struggles within companies have been described by researchers in organizational studies (Antonsen 2009).
- Researchers analysing what they called *high reliability organizations* identified the importance of features within the organizational culture

¹⁰³ CSB: *Chemical Safety and Hazard Investigation Board*.

¹⁰⁴ Unfortunately, as we already said, we do not have enough data concerning alerts listened and treated.

including *chronic unease*, the opposite of complacency with respect to risks (Weick and Sutcliffe 2001), preoccupation with failure and sensitivity to nuances that can lead to failure. Managers are encouraged to actively seek out information about potential vulnerabilities in the system and to encourage front-line workers and experts to raise any concerns they may have related to safety.

- The nuclear power sector refers to an important attribute of the organizational culture, the *questioning attitude* (INSAG 4), which encourages people to continuously challenge existing conditions and activities in order to identify discrepancies that might result in error or inappropriate action.
- A study in the finance sector¹⁰⁵ pointed to the dangers associated with a *risk glass ceiling*, a situation where information on risks does not reach top-level managers who have the power to allocate resources necessary for risk prevention. The “glass ceiling” can be caused by a tendency in the organizational culture not to share bad news, by a position of safety units within the organizational chart which is too distant from decision-makers, and by top-level managers who do not make the effort to seek out contrary opinions and signs of organizational vulnerability. A report¹⁰⁶ by the UK Financial Reporting Council (concerning the audit profession) suggests that board members have a responsibility to leave the board room to speak with front-line staff and establish their own impression concerning risks facing the organization, as well as to ensure that internal reporting channels are working correctly.
- The notion of *psychological safety* (Edmondson, 1999) is important in encouraging people within an organization to speak up and raise their concerns. Psychological safety is a shared belief, within a group, that one will not be punished or humiliated for speaking up with ideas, questions, concerns or mistakes. Training courses such as the CRM programmes implemented in many high-hazard industries have been developed both

to improve team managers’ ability to encourage debate and the voicing of concerns within the work collective, and to foster workers’ ability to speak up about their concerns.

- Firms are encouraged to establish whistleblowing policies and set up communication channels to allow reporting of concerns in a trusted environment¹⁰⁷.

For further reading on this topic, we refer to the chapter on resilience to explore theories and concepts of identifying and managing safety and risk.

11.7 Features of Whistle-Blowers and of Whistleblowing in the Civil Society

As for the whistles-blower in industry who are close to the technical dimension of operations that they deal with, whistle-blowers in civil society are close to the sources of information they disclose. They usually have direct access to the data.

Actions of whistle-blower (disclosure of “hidden” information) is often a matter of ethics. Indeed, the whistle-blower wants to share “material” with public opinion for making if know the non-ethical, not to say immoral, behaviour of the institution he/she is working for/dealing with/in contact with. In revealing the case they are concerned about, whistle-blowers know that they take personal legal risks (see § 11.8).

The channel used for dissemination of information is mainly specific media involved in investigative journalism. Another “tool” available to them begins to be widely used by whistle-blowers: it is WikiLeaks¹⁰⁸.

We also note that if monitoring or control authorities exist in the domain concerned (e.g. health system), the whistle-blower will first contact them. If the alert does not lead to “effects”, then the whistle-blower will address the mass

¹⁰⁵ Report “Roads to ruin. A study of major risk events: their origins, impact and implications”, 2011, Cass Business School on behalf of Airmic.

¹⁰⁶ FRC report on “Corporate Culture and the Role of Boards”, available from <https://www.frc.org.uk/directors/the-culture-project>.

¹⁰⁷ An example of such guidance is the report “Effective speak-up arrangements for whistle-blowers: a multi-case study on the role of responsiveness, trust and culture” by the Association of Chartered Certified Accountants (ACCA), available online.

¹⁰⁸ WikiLeaks is a non-profit organisation, initiated in 2006, that publishes secret information provided by anonymous sources.

media. It may happen that contact with the mass media is provided through non-governmental organisations.

11.8 Position of "Society" Towards Whistle-Blowers in Civil Society

The position of "Civil Society" has a twofold aspect.

On the one hand, public opinion is grateful to the whistle-blowers for keeping it informed of the malfeasance of certain institutions, as these wrongdoings may have a more or less direct impact on health, on freedoms, etc.

On the other hand, the institutions in question have an attitude of denial, and bring lawsuits against the whistle-blowers. For instance:

- Servier Laboratories sued Dr. Frachon for publishing a book on the Isomeride® case (Frachon, 2010);
- Daniel Ellsberg and Edward Snowden were prosecuted by the American Administration;
- Antoine Deltour, Raphaël Halet and Edouard Perrin¹⁰⁹ have been sued by the Luxembourg justice for the Luxleaks affair¹¹⁰;
- ...

These prosecutions (legal proceedings) can create a halo, an atmosphere of threat, not to say of fear, and lead to a **chilling effect** which inhibits or discourages the legitimate exercise of information to the public about malicious acts or malfeasance.

11.9 Treatment of An Alert

An alert is not a prediction of when the event will occur. It is even not sure that an event connected to this alert will happen. Nevertheless, it is an information about a (potential) degradation of safety level. As such, it deserves to be treated at an institutional level. It means that it has to be listened to and investigated by a

person with the authority/capability to make decision (whether in industry or in the civil domain).

The treatment of an alert has to begin as soon as possible after it is received through channels made available to whistle-blowers or used by them.

The duration of the treatment (i.e. release of the results, whatever they are) have to be issued as quickly as possible. Indeed, it is not possible to determine how far from the event the situation is. So, the quicker the potential corrective measures are implemented, the better. This neither means nor implies that the investigation must be neglected and / or carried out in a shoddy manner.

Furthermore, the whistle-blower must be kept informed (or better, associated) all along progress of the investigation.

11.10 Protection of Whistle-blowers

Protection of whistle-blowers is a recent concern. In the 1990s, the issue was still seen almost invariably in a hostile light. The term was most frequently used to describe public officials who had paid a heavy penalty for leaking information, usually to the media. Whistle-blowers were presented, if not as villains, as loners (Public concern at work, undated).

On the other hand, recent cases ("Dieselgate", "Luxleaks", "Panama Papers") have shown that whistle-blowers can play an important role in uncovering illegal activities that are detrimental to the general interest and well-being of citizens and society. So, their protection became an issue since a decade or so in several countries. A few examples are given hereafter.

The goal of protection is that the whistle-blower is not blamed or worst (e.g. pestered, laid off), because he/she released information about malfunctioning or fraud.

Some companies have put in place mechanisms that allow employees to issue alerts which could be seen as "shields" for whistle-blowers. For example, in:

¹⁰⁹ Antoine Deltour and Raphaël Halet are the former employees of the consulting firm PricewaterhouseCoopers who have uncovered the large-scale tax optimization practiced by multinationals via Luxembourg. They had communicated the documents to journalist Edouard Perrin, a

member of the organisation behind the revelations (an international consortium of investigative journalists).

¹¹⁰ For this case, see footnote 92.

- Offering "channels" to the alert launcher (e.g. confidential to the line manager, the human resources Department or the legal Department of the company, anonymous, directly to the management of the company through a dedicated Department);
- Setting up a Committee for Ethics and Social and Environmental Accountability to which any employee can report and submit cases in a confidential manner, if an employee considers there are breaches of the rules enacted by the company code of conduct;
- Setting up hotlines to warn of possible behaviour contrary to the values of the company.

It should be noted that very often in some companies, alerts should be limited to the violation of financial and accounting rules.

We note that, as an output of the 2011 G20 Summit in Cannes (France), the G20 leaders provided support to the compendium of best practices and guiding principles for whistle-blower protection legislation, prepared by the OECD, as a reference for enacting and reviewing, as necessary, whistle-blower protection rules by the end of 2012¹¹¹ (G20, 2011).

Hereafter, few examples of laws/regulations in domain of whistle-blower protection for some countries are given.

11.10.1 At the European (Union) level

The European Commission proposed (in 2018) a new law to strengthen protection of whistle-blowers across the European Union (EU). It will ensure a high level of protection for whistle-blowers who report violations of EU law by setting new Union-wide standards. This new law will see the establishment of safe channels for reporting both within an organisation and the public authorities. It will also protect whistle-blowers against dismissal, demotion and other forms of retaliation and will compel national authorities to inform citizens and train public authorities to accompany whistle-blowers.

The project proposes to set up internal structures to denounce illegal acts. These structures will have to be installed in companies with more than 50 employees, or with a turnover of more than 10 million euros, as well as in all public

administrations, from the highest level (the State) to the municipality of more than 10,000 inhabitants.

The draft of the European executive will be submitted to the two European legislators, the Council (the member States) and the Parliament.

Until then, there was only a recommendation which states *“that member States have in place a normative, institutional and judicial framework to protect individuals who, in the context of their work-based relationship, report or disclose information on threats or harm to the public interest”*. To reach this goal, *“the recommendation sets out a series of principles to guide member States when reviewing their national laws or when introducing legislation and regulations or making amendments as may be necessary and appropriate in the context of their legal systems”* (Council of Europe, 2014).

The EU law has been ratified April 19, 2019.

Every Member State of the European Union will have to transpose the Directive into their national legislation.

11.10.2 United Kingdom

The Public Interest Disclosure Act 1998 is an Act of the British Parliament which is a "shield" for whistle-blowers against detrimental treatment by their employer. It is an amendment to the Employment Rights Act 1996. It applies to cases where:

- a criminal offence has been committed, is being committed or is likely to be committed;
- a person has failed, is failing or is likely to fail to comply with any legal obligation to which he is subject;
- a miscarriage of justice has occurred, is occurring or is likely to occur,
- the health or safety of any individual has been, is being or is likely to be endangered;
- the environment has been, is being or is likely to be damaged, or
- information tending to show any matter falling within any one of the preceding paragraphs has been, is being or is likely to be deliberately concealed.

¹¹¹ The compendium was endorsed by the G20 Anticorruption Working Group.

Nevertheless, despite undeniable progress, some workers do not (yet) qualify for the whistle-blower protection (e.g. Jobseeker, volunteers, interns, non-Executive Directors, foster carers members of the armed forces and security services, self-employed workers, ...).

It has also to be noted that a disclosure of information is not a qualifying disclosure if the person making the disclosure commits an offence by making it.

Against the background in the 1990s of both serious accidents (sinking of Herald of Free Enterprise, the Clapham rail crash) and an expressed negative attitude to whistle-blowers (Villains/loners) organizations to support and advise whistle-blowers and business firms/industry companies were established. Example of such an organization is e.g. "Public Concern at Work" in 1993 (www.whistleblowing.org.uk). In 2018, a group of parliamentarians formed an All-Party Parliamentary Group/Whistleblowing (APPG/Whistleblowing), which has proposed a series of reforms to update and modernize the British legislation (including expanding the whistleblowing concept to include all citizens and establish an Independent Office for Whistleblower).

11.10.3 France

The law of 9 December 2016, known as the Sapin 2 law, relating to transparency and the fight against corruption, created a protection for the whistle-blower by requiring companies with more than 50 employees to set up procedures for collecting data and reports issued by employees or by outside and casual collaborators.

The granting of the legal status of whistle-blower is subject to the following conditions:

- Have personal knowledge of the facts;
- To act in good faith;
- Do not profit or draw compensation from the alert issued;
- Do not try to harm.

If his / her status of whistle-blower is acknowledged, the person concerned will benefit from special protection. The law provides that no person may be excluded from a recruitment procedure or access to an internship or a period of professional training, no employee may be sanctioned, dismissed or subject to a discriminatory

measure, direct or indirect after an alert. Nevertheless, some trade unions and some NGOs consider that Sapin 2 has some limits:

- The whistle-blower must denounce the facts by internal channels of the company;
- Legal persons (a company, an association, a trade union, etc.) cannot have the quality of whistle-blower;
- The whistle-blower cannot be defended by a staff representative or a union in its alert procedure.

As a consequence, in France, 42% of executives, out of the 36% who witnessed "illegal or unethical practices", did not report these abuses. If they did not warn about these shortcomings, it is because they do not have confidence in the declaration procedure. Furthermore, 51% of executives consider that it is risky to denounce unethical practices in their business. (AFP 2019).

The European Directive should address shortcomings of the current French regulation.

11.10.4 The Netherlands

In the Netherlands, investigating accidents as a timely feedback of safety mishaps in reality has a long history of about 100 years. Started in 1909 in the maritime, other modes of transportation followed in inland shipping, (1931), aviation (1937) and railways (1956). In 1999 the call for an independent and permanent investigation agency led to the establishment of the intermodal Transportation Safety Board. Due to a series of major disasters -in particular disco fires, firework explosions-, the scope of independent investigations was extended to other industrial and social sectors by establishing the Dutch Safety Board in 2005. There was felt no need to further institutionalize whistle blowing after establishing independent safety investigation organisations. However, mishaps and deficiencies triggered several cases of whistle blowing, in particular in the military and public governance sectors which were not covered by the safety board mandate. At the initiative of the chairman of the Dutch Safety Board, a separate arrangement for individual whistle blowing was established in 2016 with the Whistle Blowing Clearing House Act, providing a clearing house for reporting of mishaps and abuse. This system for individual whistle-blowers however, has not yet functioned properly due to a mismatch between staff and functions and close working relations with the Ministry of Internal Affairs (Wikipedia 2). Consequently,

in the Netherlands, facilitating whistle blowing has been successful only on an institutional level by the establishment of independent safety investigation agencies, albeit restricted to a retrospective approach.

11.10.5 Norway

Norway has a long history of whistleblowing – from individuals within a number of areas; such as industry, health and social sectors, the education sector, the armed forces, civic activities and government management. But it was only in 2007 that rules on whistleblowing were established in the Working Environment Act. The regulations included the right to whistle-blow, the way in which whistleblowing should occur, and prohibition of retaliation (which includes the right to remedy). In the present legislation, there is a duty for employees to notify in some circumstances: all workers are obliged to notify if a colleague is discriminated against or harmed or in conditions that could endanger life and health. Elected representatives at the workplace should assist workers who alerts. A representative may also notify on behalf of the notifier so that the notifier may be anonymous to the employer. A safety representative (a legally mandatory function in companies) has self-notification obligations in certain cases, such as concerning injury and illness and the risk of life and health. The regulations were partly changed in 2017. Now, businesses with more than five employees are also required to develop internal notification procedures. In addition, there are separate rules in the Equality and Discrimination Act: there is a prohibition of retaliation against anyone who has complained about discrimination, sexual harassment or any other form of harassment, such as ethnicity, disability or sexual orientation. There are also separate rules for employees in shipping.

The present legislation is undergoing change. A public exposition (NOU 2018:6) has been out for public consultation, and the Government promoted in April 2019 proposals to the Stortinget (The Parliament) concerning changes in the law, including that the scope of the field would be expanded to include certain groups that are not workers, clarifications of key concepts, sharpening the employer's duties after receiving notice and introduction of objective liability for financial loss after retaliation.

An association, the Zola Association (based on Emile Zola's defence of Dreyfus and famous article – J'accuse-) has since 1998 annually given the Zola prize to "people who openly and unafraid have uncovered or counterworked conditions that

threaten human dignity, democracy and rule of law in Norway ", including many whistle-blowers.

11.10.6 Romania

Through law of 14 December 2004, No. 571, have been regulated some measures for the protection of persons who have complained or noticed violations of the law within the public authorities, public institutions and other units, committed by persons with management or execution functions in the authorities, public institutions and other budgetary units. (Parlamentul României, 2004).

The warning had to be made in respect of any act that involves a violation of the law, professional ethics or principles of good administration, efficiency, effectiveness, economics and transparency.

We have to note that the law covers only the worker from the public sector and not those from private sector. The general principles refer more to corruption facts or offenses against the financial interests of the European Communities or public institutes.

The protection of whistle-blower refers to:

- The presumption of good faith, until proven otherwise;
- In case of a disciplinary inquiry for a whistle-blower, the inquiry commissions should invite the press and a representative of the union;
- Identity protection if the denounced is a direct or an indirect manager or he have control or evaluation tasks for the whistle-blower.

11.10.7 Portugal

Currently, Portugal only provides partial protection to whistle-blowers from specific sectors of economic activity (e.g., financial services) or certain categories of employees (e.g., civil servants).

The law no. 19/2008 of 21st April, that set out measures to combat corruption is the only one that explicitly specifies provisions concerning the protection of whistle-blowers. However, this law only refers to offences in general terms, failing in specifying which ones are included. On the other hand, as this law addresses measures to combat corruption, it can be inferred that the offences should be related to corruption and alike. So, if the term corruption is used here in its broad sense, besides the legal and criminal sense, it may also include abuse of power,

damaging management, financial participation in a business, money laundering, embezzlement, unfair advantage or influence peddling. In this context, it can be assumed that the option by the term 'offences' in the law is a deliberate decision of the legislator to encompass a wide range of crimes related with the corruption world. In addition, the legislator option by a generic term ('offences') may also include any type of irregularities that the employee may be aware of by having access to the information through the exercise of his employment, profession or duties. By way of example, this includes criminal offences such as tax-related ones, prevarication or even sexual abuse committed by an employee's colleague or a hierarchical superior, as well as administrative offences, such as labour or environmental infractions.

In all situations mentioned, the denunciation can cause damages to the whistle-blower, including disciplinary action up to dismissal, as well as when the infraction is an offence of passive corruption, in which the denunciation would deserve the same type of protection. Although it is the most appropriate understanding to reach a wide and effective protection of the whistle-blowers, this is not the solution provided for by the law no. 19/2008 of 21st April. (J.A.A. de Matos Ramos, 2018).

11.10.8 United States of America

As far we know at this moment, the history of whistle-blower protection in USA started on July 30, 1778, when the Continental Congress, enacted by "*unanimous consent*", America's first whistle-blower protection law (Snowden, 2019). The law declared that "*is a duty of all person in the service of the United States, as well as all other inhabitants thereof, to give the earliest information to Congress or any other proper authority of any misconduct, frauds, or misdemeanors committed by any officers or persons in the service of these states, which may come to their knowledge*".

The United States has an ambiguous policy towards whistle-blowers. Famous whistle-blowers have been prosecuted and jailed like Chelsea Manning¹¹², and yet there is a US law since 1989, the Dr. Chris Kirkpatrick Whistle-blower Protection Act¹¹³ (GPO, 1989). This law protects federal government employees from

¹¹² Chelsea Manning (born Bradley Manning) is a former United States Army soldier. She was convicted by court-martial in 2013 of violations of the Espionage Act and other offenses, after disclosing to WikiLeaks nearly 750,000 classified, or unclassified but sensitive, military and diplomatic documents. She was imprisoned between 2010 and 2017.

retaliatory action for voluntarily disclosing information about dishonest or illegal activities occurring in a government organization. This text reinforces the protection of US public service agents if they denounce activity of their administration, in violation with laws or regulations. The law was completed in 2007 and allows federal agents to submit evidence of violation of the law, heavy waste of public money, abuse of authority, danger to health or public safety. There are restrictions to this law. The law does not apply neither to employees of the Federal Bureau of Investigation (FBI), neither to employees of the Federal Police, nor to employees of the National Security Agency (NSA). It was again amended in 2017 with the aim of providing greater whistle-blower protections for Federal employees, increased awareness of Federal whistle-blower protections, and increased accountability and required discipline for Federal supervisors who retaliate against whistle-blowers.

On the other hand, if a person works in a company that is fraudulent to the American tax authority, he (she) is strongly encouraged to launch the alert, to denounce his(her) employer. The US tax office promises informants up to 30% of the amounts recovered through their information.

In private companies, the protection is often less effective than for federal agents. When whistle-blowers lodge complaints against their employer reprisals, the legal proceedings are often slow and inefficient.

11.10.9 Remarks on Protection of Whistle -Blowers

Legislations protecting whistle -blowers are recent. Their goals is mainly to ensure transparency and to fight against corruption and embezzlement of (public) funds. Many conditions must be met to be considered a whistle-blower and, therefore, "protected".

Moreover, with regard to the European Directive, it is not clear to what extent it conflicts with the Directive (EU) 2016/943 (June 2016) which deals with the protection of undisclosed know-how and business information (trade secrets) against their unlawful acquisition, use and disclosure. Indeed, information

¹¹³ Chris Kirkpatrick was a Department of Veterans Affairs psychologist and whistle-blower who committed suicide by gun on July 2009, he was fired from the Tomah Veterans Affairs Medical Centre in Tomah (Wisconsin). Previously, he complained about overmedicating patients at the facility.

revealed by a whistle-blower can be claimed as "sensitive" information by the incriminated institution.

Despite legal protection of whistle-blowers, it is possible to inflict damage to the reputation of individuals and organisations that serve the goal of feedback and foresight.

Recent research suggests that the proportion of whistle-blowers exposed to reprisals and retaliation is increasing — despite more or less explicit law protection. And although whistleblowing can happen via multiple channels, which has a positive effect on the scope of whistleblowing, the vast majority of whistle-blowers reports internally and to the immediate leader. Only about 2% of the whistle-blower notices to the supervisory authority as the first step.

Furthermore, the protection of whistle-blowers can be thwarted as long as their positive contribution in security (of citizens and of industrial processes). For example, some academics (e.g. Amalberti, 2013) question the role of whistle-blowers, and in particular the one played in detecting weak signals, arguing that alerts are probably more useful to the social positions of those who raise them than to the risk analysis itself.

Heroes or villains?

The role of whistle-blowers as adversary opponents to a consensus perception of what went right is frequently submitted to framing, blaming and shaming of the individual whistle-blower. Killing the messenger remains a persistent tradition after the Greek example of Laocoon.

In our times, this blaming, shaming and framing may even create an inverse picturing of the actual role and function of safety investigation agencies (Wilson and Straker 2018). In the movie 'Sully' on the ditching of UA 1549 in the Hudson river, the director Clint Eastwood transformed the role of the NTSB into the role of villain. Despite of the proof of the contrary, given by both the NTSB report on case UA 1549 and Sullenberger in his book "Highest Duty: My search for what really matters". In the movie, the NTSB was portrayed as discrediting the role of captain 'Sully' Sullenberger: Sullenberger, meanwhile was portrayed as the All-American Hero in saving the lives of the crew and passengers of flight UA 1549. The NTSB was chosen to serve the role of villain. Both the professional pilot community and the general public raised doubts about the integrity and credibility of this US governmental organisation. As a consequence of such portraying as villain, the

reputation of the NTSB as an independent and blame free safety assessor was jeopardized. (Wilson and Straker 2018).

In the realm of safety, namely occupational safety, two administrative measures would help in protecting the whistle-blowers and possibly to alleviate some of the prejudice burden associated to them. The first one would be based on a communication channel/reporting system that would enable any employee to report (anonymously or not) a safety observation, intended to correct, improve or eliminate a potentially dangerous or harmful situation related to the health and safety at work. In this context, safety observation means a communication tool available to all employees and subcontractors to report hazards or to propose safety recommendations in the workplace. The system would then analyse the safety observations submitted and propose the adequate actions, whenever appropriate. Publicizing internally all the safety observations received and the measures adopted for each one, would demonstrate that any opinion is important and motivate others to participate. The second measure, especially targeted for large-sized enterprises, would include the appointment of a safety ombudsman, in line with the ethics ombudsman figure already available in some of them. The safety ombudsman would be committed to fully respecting, amongst others, the health and safety principles at work and convey through the appropriate channels, complaints reported by employees and subcontractors. Alternatively, this role could also be played by the ethics ombudsman, with the advantage that besides the issues related to health and safety at work, all the other issues would also be reported to just one person.

11.11 Conclusion

In industry, it turns out that listening to whistle-blowers is a way to detect major degradation of safety level and, so, potentially to prevent major events. Also, middle and minor safety related unwanted events or intended events (social security) may be prevented or consequences reduced.

In that sense, listening to whistle-blowers must be an integral part of safety and / or citizens protection processes. Nevertheless, to listen to whistle-blowers does not mean to agree with them. However, listening to them should lead to open debates about industrial safety and its current and actual practices. Debates about safety could naturally, not to say mechanically, lead to an increase in safety because the organisation's mindset would change.

Taking account of whistleblowing requires the adoption of a new paradigm: to see beyond quantitative approaches and to leave room for “alternative voices” and field expertise, which is one feature of highly reliable organisations (Weick and Sutcliffe, 2001)¹¹⁴.

The solution goes through a bottom-up approach (i.e., decision-makers listening to the technical experts and front-line workers) to complement the top-down approach (i.e., decision-makers asking questions), recommended, for instance, by Conklin (2012).

Whistle-blowers cannot be an official position, a box in the organization chart. To be a whistle-blower is a specific moment in a professional career.

The entire safety burden cannot be carried by whistle-blowers. Listening to whistle-blowers seems a necessary but not sufficient condition for maintaining and increasing safety. Whistle-blowing must just be one (more) tool in the toolbox for prevention. Every sign or event, near-miss... must continue to be treated in order to increase safety. For instance, in the six months preceding the DC-10 airplane accident¹¹⁵, 1,000 incidents related to the cargo door were reported (it means about 10 incidents by DC-10 aircraft in service in the USA). It seems to “sign” a poor safety culture and safety flawed approaches in the aviation domain at that time. So, it is not a big surprise that warning of Dan Applegate was lost in an “ocean of indifference”, not to say an “ocean of denial” to safety. The curse of Cassandra lives on.

In the social domain, listening to whistle-blowers helps to fight against potential fraud and to be informed about malicious actions or misintentions of citizens or governments. They disclose information in the general interest, allow the prevention or the revelation of the flaws and dysfunctions of our States, our economies, our political and financial systems. In particular, their action has led to considerable progress in the fight against corruption. Their action has made it possible to disclose certain lies, be they lies of States or private companies, as well as certain breaches of privacy. So, their role is very important for maintaining and improving democracy.

In both cases, industry and civil society, protection of whistle-blowers is of utmost importance.

Analysing information provided by whistle-blowers should be part of Safety Management System, as a part of foresight for safety.

Foresight is about reducing uncertainty and predicting future performance. New approaches, theories, technologies and notions are still open and their desirability, feasibility and applicability is still undetermined. Their functioning may be revealed during operations as “emergent” properties with unanticipated consequences. Whistle-blowers can be seen as a specific form of operational feedback and early warnings of future mishaps in the functioning of systems and sectors.

Whistle-blowers - both individual and institutional - may serve three primary goals:

- Provide subject matter expertise
- Represent voices in a democratic participation process
- Support a multiple (ethical) value driven adaptation process which should be practiced in the context of the system in which they are applied.

Their functioning can be integrated in socio-technical systems at various levels of control. This integration could make the outsiders role of whistle-blowers obsolete and could reinstall their role as subject matter experts from within the system. Such a transition poses challenges on creating a shared repository of expertise, experiences and knowledge management, combining feedback and feed forward loops to design and operations of complex systems. As such, it may benefit foresight in safety by helping to identify early warnings of system degradation

11.12 References

ADIE (2008), Whistleblowing in Action in the EU Institutions, RBEUC, Tallinn, https://www.whistleblower-net.de/pdf/ADIE_Whistleblowing_EU.pdf, retrieved March 03, 2018.

AFP (2019), Lanceurs d’alerte : Un tiers des cadres confrontés à des « pratiques illégales » au travail, des dérives peu signalées, 20 Minutes, <https://www.20minutes.fr/societe/2646379-20191107-lanceurs-alerte-tiers-cadres-confrontes-pratiques-illegales-travail-derives-peu-signeales>, retrieved November 15, 2019.

¹¹⁴ For differences between “reliability” and “safety”, see Llory and Dien, 2006.

¹¹⁵ See § 11.1.4.2

Amalberti, R. (2013), Porteurs d'alerte et signaux faibles : à la mode... et après ?, Tribunes de la sécurité industrielle – 2013, n°01, <https://www.foncsi.org/fr/publications/tribunes-securite-industrielle/porteurs-alerte-signaux-faibles-a-la-mode-et-apres/Tribune-signaux-faibles.pdf>, retrieved September 7, 2019.

Bensadon, A-C., Marie, E. and Morelle, A. (2011), Enquête sur le MEDIATOR®, Inspection générale des affaires sociales, <http://www.ladocumentationfrancaise.fr/var/storage/rapports-publics/114000028.pdf>, retrieved April 12, 2018.

Bodet, L. and Chaverou, E. (2020), Covid-19 : ces lanceurs d'alerte menacés pour avoir dit la vérité sur la pandémie, <https://www.franceculture.fr/societe/covid-19-ces-lanceurs-dalerte-menaces-pour-avoir-dit-la-verite-sur-la-pandemie>, retrieved April 17, 2020.

Burrough, B., Ellison, S. and Andrews, S. (2014), The Snowden Saga: A Shadowland of Secrets and Light <https://www.vanityfair.com/news/politics/2014/05/edward-snowden-politics-interview>, retrieved May 18, 2019.

Canfield, K. (2017), 'The Doomsday Machine', by Daniel Ellsberg, <https://www.sfgate.com/books/article/The-Doomsday-Machine-by-Daniel-Ellsberg-12413956.php#item-85307-tbla-3>, retrieved October 9, 2018.

Chateauraynaud, F. and Torny, D. (1999), Les sombres précurseurs - Une sociologie pragmatique de l'alerte et du risque, Éditions de l'École des Hautes Études en Sciences Sociales.

Clarke, R.A. and Eddy, R.P. (2017), Warnings – Finding Cassandras to Stop Catastrophes, Harper Collins Publishers.

Conklin, T. (2012), Pre-Accident Investigations – An introduction to Organizational Safety, CRC Press – Taylor & Francis Group.

Council of Europe (2014), Protection of Whistleblowers - Recommendation CM/Rec(2014)7 and explanatory memorandum, <https://rm.coe.int/16807096c7>, retrieved March 03, 2018.

Cullen, W. D. [Lord] (2000,) The Ladbroke Grove Rail Inquiry, Part 1 Report, HSE Books, <http://www.railwaysarchive.co.uk/docsummary.php?docID=38>, retrieved April 10, 2018.

de Matos Ramos, J. A. A. (2018) A Proteção de Denunciantes de Corrupção e Criminalidade Conexa, Master Thesis, Lisbon University, Faculty of Law of Lisbon.

Dien, Y. (2006), Les facteurs organisationnels des accidents industriels, In: Magne, L. et Vasseur, D. (Coordonnateurs), Risques industriels – Complexité, incertitude et décision : une approche interdisciplinaire, pp. 133-174, Éditions TED & DOC, Lavoisier.

Eddy, P., Potter, E. and Page, B. (1976), Destination Disaster – From the Tri Motor to the DC10: The Risk of Flying, Quadrangle/The New York Times Book Co.

Edmondson, A. (1999), Psychological Safety and Learning Behavior in Work Teams, Administrative Science Quarterly, Vol. 44, No. 2 (Jun.), pp. 350-383.

Encyclopaedia Britannica, (undated), U.S. Decision-Making in Vietnam, 1945–68, <https://www.britannica.com/topic/Pentagon-Papers>, retrieved September 25, 2018.

European Commission (2018), Whistleblower protection, https://ec.europa.eu/info/sites/info/files/placeholder_11.pdf, retrieved May 06, 2019

Finn, P. (2002), Crash Described as “Exceptionally Unlucky”, The Washington Post, July, 3.

Frachon, I. (2010), Mediator 150 mg : Combien de morts ?, 2nde édition, Éditions-dialogues.fr. Dialogues,

Frantzen, C. (2004), Tango on an Asymptote, 13th SRA Europe Annual Conference, Paris, 15-17 November.

Gafni, M. and Garofoli J. (2020), Exclusive: Captain of aircraft carrier with growing coronavirus outbreak pleads for help from Navy, San Francisco Chronicle <https://www.sfchronicle.com/bayarea/article/Exclusive-Captain-of-aircraft-carrier-with-15167883.php>, retrieved April 4, 2020.

GPO (1989), Whistle blower Protection Act, Public Law 101-12, <https://www.govinfo.gov/content/pkg/STATUTE-103/pdf/STATUTE-103-Pg16.pdf>, , retrieved May, 22, 2018.

G20 (2011), G20 Anti-Corruption Action Plan - Protection of Whistleblowers, <https://www.oecd.org/g20/topics/anti-corruption/48972967.pdf>, retrieved September 3, 2019.

Hermange, M-T. (2011), Rapport d'information fait au nom de la mission commune d'information sur : "Mediator : évaluation et contrôle des médicaments", Rapport du Sénat n° 675, <http://www.senat.fr/rap/r10-675-1/r10-675-11.pdf>, retrieved March 03, 2018.

Hollnagel, E. (undated), From Safety-I to Safety-II: A brief introduction to resilience engineering, <http://safetysynthesis.com/onewebmedia/Introduction%20to%20S-I%20and%20S-II.pdf>, retrieved March 01, 2018.

Hollnagel, E. (2014), Safety-I and Safety-II: The Past and Future of Safety Management, CRC Press – Taylor & Francis Group.

Kemeny, J. G., Babbitt, B., Haggerty, P. E., Lewis, C. D., Marrett, C. B., Mc Bride, L., Mc Pherson Jr, H., Peterson, R., Pigford, T. H. and Trunk, A. (1979), The Need For Change – The legacy of TMI, Report of the President's Commission On The Accident At Three-Mile Island, Government Printing Office, Washington DC.

Johnson, S. (2020), NHS staff forbidden from speaking out publicly about coronavirus, The Guardian, April 9.

Lapierre, D. and Moro, J. (2001), Il était minuit cinq à Bhopal, Éditions Pocket Robert Laffont Pocket.

Lefébure, A. (2014), L'affaire Snowden - Comment les États-Unis espionnent le monde, Éditions La Découverte.

Lewis, P. and Hilder, P. (2018), Former Cambridge Analytica exec says she wants lies to stop, The Guardian, <https://www.theguardian.com/uk-news/2018/mar/23/former-cambridge-analytica-executive-brittany-kaiser-wants-to-stop-lies>, retrieved November 10, 2019

Linder, D. O. (2011), The Pentagon Papers (Daniel Ellsberg) Trial: An Account, <http://law2.umkc.edu/faculty/projects/ftrials/ellsberg/ellsbergaccount.html>, retrieved October 9, 2018.

Llory, M. (1996), Accidents industriels : le coût du silence - Opérateurs privés de parole et cadres introuvables, Éditions L'Harmattan.

Llory, M. and Dien, Y. (2006), Les systèmes sociotechniques à risques : Une nécessaire distinction entre fiabilité et sécurité, Partie 1 : Performances n°30, septembre – octobre, pp. 20-26, Partie 2 : Performances n°31, novembre – décembre, pp. 9-13, Partie 3 : Performances n°32, janvier – février, pp. 20-26.

McCall, J. (2017), Modern day heroes: a multiple case study of how successful flight crew and air traffic control coordination helped prevent disaster. International Journal of Current Research Vol 9, Issue 11, pp. 61268-61275, November 2017

McKie, Robin (2011), Japan ministers ignored safety warnings over nuclear reactors, The Guardian, <http://www.theguardian.com/world/2011/mar/12/japan-ministers-ignored-warnings-nuclear>, retrieved May, 12, 2019.

Miller, J. (1995), Millstone's Neighbors in a Quandary, The New York Times, November 5.

Near, P. and Miceli P. (1985), Organizational dissidence: The case of whistleblowing, Journal of Business Ethics, pp1-16.

Obermayer, B. and Obermaier, F. (2017), The Panama Papers: Breaking the Story of How the Rich and Powerful Hide Their Money, Oneworld Publications.

Obermayer, B. and Obermaier, F. (2016), Panama Papers. Die Geschichte einer weltweiten Enthüllung, Kiepenheuer & Witsch GmbH

Parlamentul României – Legea Nr.517/2004 privind protecția personalului din autoritățile publice, instituțiile publice și din alte unități care semnalează încălcări ale legii.

Pooley, E. (1996), Nuclear Warriors, Time Magazine, vol. 147 n° 10, March 4.

Public concern at work, (undated), The Whistleblowing Charity, <http://www.whistleblowing.org.uk/business-support>, retrieved September 9, 2019.

Ringdahl, L.H. (2004), Relationships between accident investigations, risk analysis, and safety management, Journal of Hazardous Materials, Vol 111 n°1-, pp):13-19

Rogovin, M. and Frampton, G. T. (1980), Three Mile Island - A Report to the Commissioners and to the Public, Vol I, NRC Special Inquiry Group, NUREG/CR-1250, Washington DC.

Schein, E. (2016), Whistle Blowing: A Message to Leaders and Managers. Comment on “Cultures of Silence and Cultures of Voice: The Role of Whistleblowing in Healthcare Organizations”, International Journal of Health Policy and Management, 2016, 5(4), 265–266

Secrétariat d’État aux Transports (1976), Rapport final de la Commission d’Enquête sur l’accident de l’avion D.C. 10 TC-JAV des Turkish Airlines survenu à ERMENONVILLE, le 3 mars 1974, Journal Officiel de la République Française, Éditions des documents administratifs, N° 27 du 12 Mai.

Shrivastava, P. (1992), Bhopal Anatomy of a Crisis, 2nd edition, Paul Chapman Publishing.

Snowden, E. (2019), Permanent Record, Metropolitan Books.

Szadkowski, M. (2019), « The Great Hack » : plongée dans les eaux troubles du marketing politique de Cambridge Analytica, Le Monde, https://www.lemonde.fr/pixels/article/2019/07/24/the-great-hack-plongee-dans-les-eaux-troubles-du-marketing-politique-de-cambridge-analytica_5492703_4408996.html, retrieved November 10, 2019.

Telegraaf (2017), Raadsel vliegcrash opgelost? (Air crash mystery solved?) Newspaper clipping Dutch Newspaper De Telegraaf pp T18. 21 December 2017

THE WHISTLE BLOWERS PROTECTION ACT, (2014), <http://legislative.gov.in/sites/default/files/A2014-17.pdf>, retrieved May, 6, 2019.

Turner, B. and Pidgeon, N. (1997), Man-Made Disasters, 2nd edition, Butterworth Heinemann, Oxford [1st edition: Turner, B. (1978), Wykeham Publications].

U.S. CSB (2007), Investigation Report, Refinery Explosion and Fire, BP – Texas City, Texas, March 23, 2005, Report N°2005-04-I-TX.

Vaughan, D. (1996), The Challenger Launch Decision - Risky Technology, Culture, and Deviance at NASA, The Chicago University Press.

Wells T. (2009), Wild Man - The Life and Times of Daniel Ellsberg, Palgrave Macmillan

Weick, K. and Sutcliffe, K. (2001), Managing the Unexpected – Assuring High Performance in an Age of Complexity, Jossey-Bass Publishers.

Wikipedia 1 (undated), Joseph P. Kennedy Jr. [wikipedia.org/wiki/Joseph_P._Kennedy_Jr](https://en.wikipedia.org/wiki/Joseph_P._Kennedy_Jr), retrieved June 7, 2018.

Wikipedia 2 (undated), www.ad.nl/binnenlands/huis-voor-klokkenuiders-kostte-negen-miljoen-en-loste-nul0zaken-op~a0e6d73f/, retrieved June 7, 2018.

Wikipedia, 3 (undated), Vietnam War, https://en.wikipedia.org/wiki/Vietnam_War, retrieved November 24, 2018.

Wikipedia 4 (undated), Daniel Ellsberg, (https://en.wikipedia.org/wiki/Daniel_Ellsberg), retrieved September 15, 2018.

Wikipedia 5 (undated), Randy Kehler, https://en.wikipedia.org/wiki/Randy_Kehler, retrieved September 8, 2018.

Wilson K. and Straker D., 2018. Fiction versus reality: The Impact of Hollywood on Accident Investigation. ISASI Forum, Oct-Dec 2018. P 24-26.

Wilson, K. and Straker, D. (2018), Fiction versus reality: The Impact of Hollywood on Accident Investigation. ISASI Forum, Oct-Dec 2018. Pp 24-26.

This chapter is extracted from the final technical report of the ESReDA Project Group *Foresight in Safety*. The full report is freely downloadable from the [ESReDA web site](#) and from the [EU Joint Research Centre publications repository](#).

Bibliographic identifiers for the full report are indicated below.

PDF	ISBN 978-92-76-25189-7	ISSN 1831-9424	doi: 10.2760/814452	KJ-NA-30441-EN-N
Print	ISBN 978-92-76-25188-0	ISSN 1018-5593	doi: 10.2760/382517	KJ-NA-30441-EN-C



Unless otherwise noted, the reuse of this document is authorised under a [Creative Commons Attribution 4.0 International](#) (CC BY) licence. This means that reuse is allowed provided appropriate credit is given and any changes are indicated.

All content is copyright by the authors, except for the cover photo by Christopher Liang, 2009, distributed under a Creative Commons Attribution licence from flic.kr/p/5Q3dg7.

“Enhancing Safety: The Challenge of Foresight”

Edited by the ESReDA Project Group *Foresight in Safety*.

How to **cite this report**: ESReDA Project Group Foresight in Safety, *Enhancing Safety: The Challenge of Foresight*, EUR 30441 EN, Publications Office of the European Union, Luxembourg, 2020. ISBN 978-92-76-25189-7, doi: [10.2760/814452](https://doi.org/10.2760/814452), JRC122252.

