

# **Instituto Superior de Psicologia Aplicada**

Mestrado em Comportamento Organizacional

## **More than erosion: a Grounded Theory analysis of the Entre-os-Rios disaster**

DISSERTAÇÃO ELABORADA PARA A OBTENÇÃO DO GRAU DE  
MESTRE EM COMPORTAMENTO ORGANIZACIONAL

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Para além das muitas pessoas a quem devo gratidão, também penso que fui beneficiada por alguns acasos e/ou oportunidades da vida; por isso considereei dever mencioná-las logo no início desta secção.

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## LIST OF ABBREVIATIONS AND ACCRONYMS

AMP	Administração Marítima e Portuária
CDI	Centro de Documentação e Informação
CPD	Capitania do Porto do Douro
DI	Dossier de Imprensa
DRAN	Direcção Regional do Ambiente do Norte
HRO	High Reliability Organizations
ICERR	Instituto para Conservação e Exploração da Rede Rodoviária
ICOR	Instituto para a Construção Rodoviária
IEP	Instituto das Estradas de Portugal
IND	Instituto de Navegabilidade do Douro
ISPA	Instituto Superior de Psicologia Aplicada
JAE	Junta Autónoma das Estradas
NAT	Normal Accidents Theory
OL	Organizational Learning

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## ABSTRACT

This study undertook a qualitative analysis of the Entre-os-Rios bridge collapse seeking to understand the organizational processes that were behind it.

It focused on journal articles from a daily (O Público) and a weekly (Expresso) newspapers that were published in the year of the disaster. The method used was Grounded Theory.

Through a series of steps thoroughly described, initially emerged Open Codes were gradually processed until obtaining a reduced and increasingly abstract set of theoretical concepts. These concepts were organized in categories, properties and dimensions, and later distributed under conditions, according to causal relations. This procedure was further supported by literature review undertaken at a later stage of the research process. From this analysis a grounded model for the Entre-os-Rios disaster was presented and two categories were identified and proposed as core concepts.

From the confrontation of research results with scientific literature in the field of disasters, fit was recognized in many cases. Some other cases were also suggested as potential new issues to consider in this research area.

Finally, an interpretation for the Entre-os-Rios disaster was attempted drawing on data emerged from this study and with literature support.

## RESUMO

Efectuou-se uma análise qualitativa do desastre de Entre-os-Rios visando compreender quais processos organizacionais que nele intervieram.

A análise incidu sobre todos os artigos de um jornal diário (O Público) e de um semanário (Expresso) publicados até ao final do ano em que ocorreu o desastre. O método aplicado foi a "*Grounded Theory*".

Através de um processo desenvolvido em várias fases devidamente descritas, passou-se de um conjunto de conceitos iniciais e não-elaborados ("*open codes*"), para um número progressivamente reduzido de conceitos teóricos organizados em categorias, propriedades e dimensões e DEPOIS distribuídos de acordo com

relações causais. A crescente abstracção dos conceitos, apoiada apenas numa fase tardia pela revisão da literatura relativa a desastres, possibilitou a apresentação de um modelo "Grounded" para o desastre de Entre-os-Rios. Propuseram-se 2 conceitos nucleares culminando o processo de análise elaborado.

Da confrontação dos conceitos baseados na análise dos artigos-fonte, com a literatura da especialidade, considerou-se haver ajuste em muitos casos; noutros casos sugeriu-se a hipótese de novos conceitos teóricos relativos à área de estudo.

Finalmente procurou-se fornecer uma interpretação do desastre de Entre-os-Rios à luz de todos os dados obtidos neste estudo.

## INTRODUCTION

The present work describes a qualitative study of the organizational issues involved on a bridge collapse disaster happened in Portugal in 2001, and known as the Entre os Rios disaster, from the locality where it occurred.

The overall aim in this study was to explore critical influences on the onset and development of this specific accident, particularly those related to organizational behaviour and management.

Human error is an ordinary and frequent feature, both at individual and organizational levels. How it can lead to consequences with entirely different dimensions, ranging from the daily annoying event to the tragedies we call disasters, is an obvious matter of general concern.

Cognitive psychology, decision-making processes, strategic management, have been some of the topics through which organizational sciences have approached error and failure. Another related field, focusing on accidents or disasters can be considered as even more distant from mainstream literature. However, it is an area of study with long-established roots in Social Sciences research.

Not subject to the famous management fads, some of its most relevant works keep their value, despite having been published for many years from now. Pioneers like Barry Turner in 1976, Charles Perrow in 1981 and even Honorable Peter Mahon, not as a researcher but hereby considered for his organizational approach to the Report on Mount Erebus accident in 1981, were much ahead of their time.

Some of its writers refer the study area as "fascinating" (Anheier 1999; Turner, 1976a) and in fact, it has attracted many practitioners and scholars from different backgrounds.

This has both the merit of adding value to the field, out of the different lenses applied, and of bringing to this literature a wider and richer narrative context.

There are many reasons why accidents have been attracting considerable research. These reasons deserve a mention here although truly they were not all kept in mind at the beginning of this work. Some were only brought to our attention at a later stage, after the literature-reviewing phase.

First, the basic concern underlying all others: the fact that society's lifestyle together with technology developments enable the occurrence of increasingly large scale accidents with more extended consequences (either human and economic) making this issue a more pressing and global matter of concern.

Second, the assumption that, across different accident and disaster cases, there exist similar features that can be brought to light and thus analysed, in order to understand their nature, and consequently their cause. This goes along with a much general human tendency (and a specific managerial one) that hopes to design the right technology or process, and prescribe the best formula to prevent any unwanted situation to happen.

Third, modern organizational trends, which highlight organizations increasingly becoming as very risky endeavours, constantly facing many kinds of danger, and therefore considered as disaster prone as some specific areas of activity traditionally considered as dangerous, such as nuclear power or mining.

Fourth, the unexpected finding of how much this field produced interactions with many important and diverse organizational issues.

Fifth, the extended contribution of disaster studies to other areas. Military intelligence, engineering safety in construction, besides safety as a general issue, are to be mentioned among many others.

From this outline, it also becomes clear that both theoretical and practical issues and purposes mix together in this area of study.

Having thus set, in broad terms, the general framework for our study the reasons for choosing this particular case follow.

A first reason was the fact that this was a very dramatic accident, reported as the main road accident for centuries in Portugal. Many lives were lost, and through this, it brought the most ravaging consequences at many levels (human, professional, economic, political, local and national). Nowadays, Entre os Rios keeps cited as a major event in Portugal for that specific year. For such unfortunate reasons it can be considered a significant disaster, and thus deserving to be analysed.

The officer in charge of the rescue and salvage operations, in the book he wrote describing his experience while dealing with this assignment, mentions "...uma vez que acidentes desta dimensão, com tantas condicionantes e tão grande exposição mediática, são raros no mundo" (Ezequiel, & Vieira, 2001, p. 55)

A second reason was the fact, that even from a very preliminary and non-scientific approach, the specific features behind the Entre os Rios disaster appeared to present a rich field of complex organizational interrelations that seemed suitable for a kind of study within an organizational scope. Multiple constituencies, from completely diverse settings were involved and such characteristics were considered particularly adequate to fit the present study's intentions.

### *Literature review rationale*

Under the rules approved at Instituto de Psicologia Aplicada, (ISPA) for the writing of a dissertation (ISPA, 2000; ISPA, 2001-2002) a literature review should be presented here.

The fact that this does not happen in this section deserves proper explanation.

The present research study, was carried on using a Grounded Theory methodology. This implies that there was a deliberate intention to avoid literature reading at the beginning of the study specifically in what refers to the specialized fields of error, failure, accidents or disaster.

The risk of going against what constitutes the approved presentation canon for master thesis, compared to the need of describing the research steps such as they were in fact developed, and also without betraying the methodological requirements of Grounded Theory, brought about the option for the latter form of presentation.

This led to the decision of introducing the essential literature review at a later stage of this text. Mentions to the scientific readings will therefore merge with data analysis and discussion of the findings.

However, another kind of literature review, not related to the subject area chosen for investigation, was also critical to this work. It refers to the methodological awareness, which took place at an initial stage of the present study.

Such reading was necessary first, while choosing the most appropriate method for analysis and mainly later on, to gain a deeper understanding of Grounded Theory, which demanded a significant amount of time by its own.

Hoping to analyse and compare academic thesis that reported using Grounded Theory in the areas of Organizational Behaviour and Management, a specific search was performed for this purpose using the free access internet interface of the UMI ProQuest dissertations' database (<http://www.lib.umi.com/dissertations/>), albeit allowing a very limited back search in its open access version. Nørgaard's (2001) PhD thesis was selected and obtained by download from UMI. At national level, a similar search in the national bibliographic database Porbase, a national cooperative database runned by the Portuguese national library and incorporating mostly books and thesis (<http://www.sirius.bn.pt/sirius/sirius.exe>), identified a master thesis on Organizational Behaviour, ISPA's dissertation of J. V. Cunha (1999). A third PhD thesis also using Grounded Theory, although in the field of Library and Information Studies (Correia, 1996), was obtained on personal basis directly from its author.

Those documents proved also very useful at later stages of the present research work, although they were not very explicit about the procedures

undertaken, and choosed different presentations for their research findings. Such diversity happened to be useful for our purposes, because it enabled the detection of less visible similarities that escaped superficial reading, yet also supported the possibility of adequately justified divergences.

### *Entre os Rios disaster*

#### *A brief description of the accident*

The bridge of Hintze Ribeiro (named after a Portuguese politician of the late nineteenth century), was a centennial iron bridge over the Douro River, a few miles to the southeast of the city of Oporto.

Used as a roadway it linked two opposite margins' towns - Castelo de Paiva and Penafiel - each one belonging to a different administrative region (concelho). Their geographical situation is Northeast Portugal, inner region.

Its construction began by 1884, and the bridge was open to traffic at 1886. The structure was still in full use at the date of the accident, although not allowing the simultaneous crossing of two heavy vehicles because of its 3 meters wide.

The fourth March 2001, short after 9 p.m., two of the bridge's pillars collapsed, dragging part of the roadway they sustained into the river. All vehicles circulating by then over that road section, plunged into the wild waters. An autobus and two cars disappeared instantly with all their passengers - 59 people died, all those reported missing. Most of them were locals, friends and families coming back home after a travel tour in southern Portugal. Almost each family from the surrounding villages lost from one relative, to several family members at that time.

This year was reported to suffer from an exceptionally severe winter, with strong winds and high rain levels. The waters of the Douro River were so wild by that time, that diving and other intended operations to search for victims were forbidden for security reasons during several days following the disaster, in spite of the anxiety for rescue first, and retrieval later.

Therefore, most corpses could not be recovered, which added an additional stress to both families and authorities. Some of the deaths were pushed by strong streams so far as northern Spain, where they appeared at the so called "Death Coast", but the majority was never found.

This disaster produced a cascade of events at several levels:

At personal level, many of its consequences are still to be fully acknowledged, in spite of immediate local psychological support provided to the population.

At political level, it led directly to the resignation of one Minister and indirectly, it is believed to greatly contributing to the later fall of Government.

At administrative level, it uncovered many contradictory features most of which will be referred later on.

At ethical level, it raised many uncomfortable issues most of them pertaining to the values of responsibility and accountability either imposed to, or assumed by people from all positions and areas.

#### *A brief presentation of the settings*

About the organizations involved in the settings (the bridge itself and its environment) and in the development of the disaster, most data will be mentioned later in greater detail, while discussing the research findings. There are some facts however, that should be presented beforehand, so as to provide a better picture of the framework where those events took place, and therefore facilitate their understanding by the reader.

Until 1999, every bridge responsibility (such engineering structures are technically called “obras de arte” and commonly “pontes”) was attributed to Direcção de Serviço de Pontes, a department of Junta Autónoma das Estradas (JAE) by its turn an organism depending of the Ministério das Obras Públicas, later named Ministério do Equipamento Social.

In 1999, JAE was extinguished as such. Three institutes were created in its place: Instituto das Estradas de Portugal (IEP) Instituto para Conservação e Exploração da Rede Rodoviária (ICERR) and Instituto para a Construção Rodoviária (ICOR) with different, although complementary objectives.

The president of each institute integrated a governing board under the lead of IEP’s president, who was chairing. Thus, the name of IEP is often used for the whole structure.

The idea of constructing a new bridge to substitute the centenary Hintze Ribeiro is mentioned since late eighties, but was never materialized against the will and efforts of local mayors and inhabitants of the region.

Other important elements of the accident settings are the Douro River Administration, and the activity of sand extraction from the margins.

Until 1997, two different organisms had jurisdiction over the Portuguese border of this international river. The Capitania do Porto do Douro (CPD) under the administration of Administração Marítima e Portuária (AMP) itself an organism of the Ministério do Equipamento Social, controlled sand extraction activities while the

Direcção Regional de Ambiente do Norte (DRAN), under dependence of the Ministério do Ambiente, supervised adjudication of the sand lots for exploitation.

In June 1997, a new institute was created to regulate the navigable branch of the river. It was named Instituto de Navegabilidade do Douro (IND) and it produced an exception into the national management of water resources.

By this change, the river's administration was shared among 3 Ministries: Ambiente, Planeamento and Equipamento Social, where the first 2 were consulting parties. A few years later however in 1999, the Ministério do Equipamento Social became the only administrative direction over IND.

DRAN (Ministério do Ambiente) kept charge of the river's borders from an environmental perspective. IND acted as sole supervising entity over sand extraction (also including licensing emission and its connected payments).

Such are, on an intended brief description, the intervenient parts into the complex situation later analysed.

## METHODOLOGY

### *Research design*

We claim our conceptual framework to be based on weak social constructivism, as stated by Schwandt (2001, p.33).

We chose the qualitative approach to this research because important variables were unknown, and a first organizational study of this accident was to be envisaged as an exploratory one.

Besides, although the field of accidents has already a relevant body of research, the fact that this accident took place on a new cultural context (Portugal) could imply significant differences before existing theories.

The strategy of inquiry informing our research procedures was Grounded Theory. Data sources employed were newspaper articles.

Methods used for data collection and analysis will be detailed in proper sections of this chapter, immediately after introducing some of the research decisions that were taken.

Although use of Grounded Theory as an approach, both to theory generation and to data analysis, immediately implies the use of analytic induction, we are aware that deductive explanations were also developed in the course of our study. (Miller, & Brewer, 2003).

### *Grounded Theory*

#### *A rationale*

After our research field had been settled on the field of organizational error and accidents, as well as on the disaster to be focused, the choice of a qualitative research paradigm came as a natural choice, as above stated.

However, choosing the method of analysis was not so straightforward.

At this point, authors who published specifically with the purpose of assisting on the evaluation of most well known research methods, provided useful guidance (Lee, 1999; Schwandt, 2001).

Besides their orienting role, some also pointed to particular research works considered to best illustrate the application of a specific method. Some investigation

works published on the field of disaster were mentioned and introduced by this way, and their methodological approaches evaluated, as more meaningful for our choice.

Vaughan's study of the Challenger using an ethnomethodological approach, which she described as "analytic induction" and "historical ethnography" (Vaughan, 1996), and Barry Turner's research on accidents using Grounded Theory (Turner, 1976b), were considered paradigmatic enough to restrict the methodological choice between the two.

A "Challenger-like" (Goodman, 2000) research investigation looked appealing at first. Vaughan recommended the use of ethnographic approaches for organizational studies, although she also came to describe the methodological inflections she decided to apply later, during her famous Challenger research (Vaughan, 1996). It took her several years of complete immersion in NASA where she analysed thousands of archival documents. She also interviewed dozens of people from many professional profiles and levels of the organization, as well as from other related entities.

There were several reasons not to choose this method for the Entre os Rios research.

First, the fact that the breath of this work was never intended to develop as extended, both in time and in effort, as Vaughan's investigation, neither the researcher's experience nor knowledgeability can bear comparison.

Second, the fact that Vaughan was conducting her academic research under the official support of NASA, a possibility that was never, even remotely, taken into consideration for the present study. The main reason here, was that the web of interconnected organizations with some kind of jurisdiction over the bridge, was considered to be by itself a part of the enquiry problem. Furthermore, there was no single "major" organization to start with.

Also, while in NASA there existed an institutional determination to understand the whys, in our case there was expressed desire to push any questions away of the organizations.

Other reasons aroused from the great emotional weight affecting the majority of people involved, whether by being somehow related to the victims, or by fearing some degree of blame on the case.

Considering the ethnomethodologist's desirable participation (whether or not considered as obtrusive) into the field, all those circumstances were judged inadequate to the application of such method to the present study.

Curiously, Grounded Theory has some identical features to ethnomethodology, among which constant comparison (Titsher, Meyer, Wodak, & Vetter, 2000).

Vaughan (1996) regarded her study of the Challenger case as having generated a “grounded theory of situated action”, by which both organizations and individuals cannot be understood without their context. Furthermore, Grounded Theory was also reported (Titsher et al., 2000, p 99) as being envisaged by some authors as a “complement to ethnographic text analysis”.

However, Grounded Theory is fully recognized as an independent scientific research method by its own.

As mentioned earlier, a decisive contribution to the choice of this method, was the fact that Barry Turner applied Grounded Theory on one of the first large impact scientific studies ever made on disaster.

This was referred both by Bryman (1989, p 93) who mentioned “...Turner’s (1976) analysis of official reports of three disasters in Great Britain which were used to develop a model (using grounded theory)...” and by Locke (2001, p 72) who also brought attention to the use of Grounded Theory by Turner, when “...investigating how large scale disasters occur (1978)...”.

Curiously, Turner also came to play a significant role in the clarification of many of Grounded Theory’s procedures. Methodological articles he published (Turner, 1981; 1983) happened to provide rare, and extremely useful guidance, in the development of many steps of the research process.

Many of the reasons for choosing Grounded Theory as the method for this research on accidents can be found in those articles. We will only underline here that it is viewed as particularly appropriate for the analysis of a single activity or phenomenon, and whenever elusive data are at stake.

#### *Literature review synopsis*

This method is included in the qualitative research paradigm, though sometimes appearing mixed with action research (Clegg, & Hardy, 1999).

It was launched by an original work of Bernard Glaser and Anselm Strauss published in 1967 and entitled “The Discovery of Grounded Theory”.

Used at first as a sociological research method in the Health context (Nursing), Grounded Theory has been increasingly applied as a general research methodology in other disciplines (Goulding, 2002), such as Psychology, Education and, more recently, Management.

Their Authors’ background was quite different: Glaser from Columbia University quantitative school of sociological research and Strauss from Chicago University, working under the qualitative paradigm of investigation and embedded into the “symbolic interactionist” tradition.

Possibly, those differences later contributed to their irreparable division and to the development of their distinct theoretical lines, both keeping the label of Grounded Theory. Certainly, the outcomes of this conceptual divergence also contributed to the complexity of the methodology itself.

It must be acknowledged here, that although being exciting in its application and appealing as a source of theory generation, Grounded Theory raises many fundamental questions to the researcher, both conceptual and practical in nature.

Some methodology authors (Dey 1999; Locke, 2001) consider that there was insufficient explanation from the original creators of Grounded Theory about some of the method's concepts and processes.

That is a possible reason why many existent studies, although using Grounded Theory's main terminology, seldom detail the steps followed in doing so.

The lack of practical guidelines to support important stages of the research process also contributed to a growing number of papers claiming to use Grounded Theory, while in fact presenting a great variety of approaches among each other.

Unfortunately, many such disorderly applications of the method are taking place across an increasing range of scientific areas, thus spreading a multiplication of versions that are losing sight of their links to the initial principles.

In fact, an important cause of criticisms made to Grounded Theory, refers to "the misuse and abuse of its principles and procedures" (Goulding, 2002, p 155).

Depending on the perspective upon this issue, some authors speak of transgression (Goulding, 2002), others of adaptation (Locke, 2001; Wood, & Kroger, 2000), others still, endorse evolving methods for grounded theory generation, such as "Dimensional Analysis" by Schatzman (Robrecht, 1995). Wilson, & Hutchinson (1996) publish an article entirely dedicated to addressing methodological mistakes in the use of Grounded Theory. Dougherty (2002) wisely chooses an umbrella name "Grounded Theory research methods".

It should also be emphasized that, when Grounded Theory is applied in close accordance to its principles, it is often felt as risky and "time-consuming" (Lee, 1999, p 50).

The existence of software specifically conceived to aid researchers on this endeavour, goes from being merely mentioned (Dey, 1999), to constituting the sole way some authors present Grounded Theory (Strati, 2000). However, the use of computers for this purpose, as expected, raised other kinds of issues that also have to be taken into consideration (Dey, 1999). A major one comes by setting an easier and more standardized route to a process that was designed to stress "creativity, conceptualization and theoretical endeavour" (Dey, 1999, p.273).

I cannot avoid citing Dey (1999) a deep studios of Grounded Theory, when he says, «There is an irony – perhaps a paradox – here: that a methodology that is based on “interpretation” should itself prove so hard to interpret. Of course, there is no single, correct “interpretation”, but a plurality of “interpretations”». (Dey, 1999, p 23).

### *Presentation of some research decisions*

#### *Theoretic sensitivity*

“Theoretic sensitivity” is the designation for the desirable degree of knowledgeable expected for the researcher to have, before fieldwork initiates.

It aims at providing adequate alertness to the issues on investigation, whilst avoiding contact to research findings (of the field under research), thus looking to preserve a non-biased approach to the data to be analysed.

This notion, although seeming clear in its purposes, is another conceptual issue of Grounded Theory where there is nothing of a consensus, and always implying some interpretation about its real meaning (Dey, 1999; Locke, 2001). The span of possibilities about this interpretation has included subjective degrees of what constitutes acceptable reading level, before initiating field research (Cunha, 1999).

In compliance with the principle of Grounded Theory, at the start of our study there were no readings done on the field under research (areas of error, failure, accidents and disasters), and until reaching a later phase where they are specifically recommended.

#### *Bibliographic research methodology*

Usually considered a lengthy process, search and collection of the bibliography was initiated as soon as the area was defined, and in spite of the resolution to postpone any literature reading until the proper moment of the research process. This precaution proved to be right, once works were not easily available either in libraries or in bookstores, as they are not within mainstream organizational literature.

Goodman’s (2000) book on the concept of “organizational linkages” had been so far the only reading undertaken that had any sort of links to the disaster area. Actually, his allusions to specific accidents, although used as background cases to support the main purpose of the work, worked as the first trigger to our choice of this scientific field. Therefore, this work was used as the natural starting point to the bibliographical search required.

Books: although operating as a virtual bookstore, Amazon (<http://www.amazon.com>) enabled a fast constitution of a first set of books on the area, once its browser effectively links different works within a same subject area. Institutional background of the authors, publishing house, people who presented or commented the work, as well as electronic visualization of the table of contents were some of the elements that provided minimum quality criteria during this kind of searching and selection process, without betraying our theoretical sensitivity purpose.

Many of the books that were located by this means were not very recent, but could be bought through commercial circuits, either as reprints or as new editions. Other were obtained as "used". Two were located in Portugal through the Porbase search page, as previously cited. The ones selected were borrowed from their owner libraries.

Checking the references of each newly arrived book, progressively reassured us that a significant part of the core literature had been collected.

Journal articles: an exhaustive search was conducted in January 2002 in the electronic bibliographic databases Emerald and UMI ProQuest subscribed by the Departamento de Gestão of the Faculdade de Economia of the Universidade Nova de Lisboa (UNL). However most of the articles picked by then, later on proved not adequate to the specific purpose of the research, because of the many different facets the field of accidents may present.

Cross-referencing articles from the books, and browsing over the recommended bibliography in some Internet sites of reliable academic institutions that were offering courses, partially or totally dedicated to the subject, unexpectedly proved to be a more useful source of scientific article gathering, in this particular case. This is the case, for instance of the Risk and Crisis Management Course of Sheffield University (<http://www.shef.ac.uk/~mcn/6810/reading>).

Academic dissertations: thesis on accidents, viewed through organizational lenses, were not identified using the free access internet interface of the UMI ProQuest digital dissertations' database. A particular thesis (Turner, 1976), studying accidents by means of Grounded Theory, was recurrently mentioned in the collected literature, although not traced in the database because of its earlier date. A copy was thus obtained from the British Library Lending Division.

Internet sites: although heavily consulted they were mostly used as starting point, through scientific journals' table of contents or abstracts. Non-identifiable sites, dates and authors were some of the mandatory features for a cautionary

approach of such information. Preference was therefore for academic environments, leading to refereed material citations.

### *Ethical issues*

Grounded Theory research studies rely most often on observation and interviews. Observation was impossible in this case, because of the nature of the phenomenon under study.

At the beginning of this work, and still today, the dramatic context of the events and their proximity in time, was contrary to the idea of applying any interview process. Interviewing was not taken into consideration, mostly because of ethical considerations.

All the accident's victims were dead. Their relatives and friends were too emotionally involved and stressed. We also think that because they were not aware of many of facts about the disaster before it developed, their contribution could eventually be more emotionally biased than informative.

This study was also judged to be too close to the events, in what refers to other players. People from the organizations involved could eventually give some useful hindsight, but many of them were still facing official enquiries. Although in a different way, they too were to be regarded as emotionally concerned, and looking forward to justify their actions, their decisions, (i.e.) themselves.

Maybe with a greater distance in time such research techniques will be usefully envisaged for this same object of study.

### *Documentary sources' rationale*

As stated above, data sources used in Grounded Theory are mostly associated with observation and interviews, though the type of source analysed greatly varies, and includes documentary sources as well (Dey, 1999; Goulding, 2002; Locke, 2001; Strauss, & Corbin, 1998; Titscher et al., 2000).

In their fresh initial approach to Grounded Theory, Glaser and Strauss even recommend researchers "to be as skilled and ingenious in using documentary materials as in doing field work. These materials are as potentially valuable for generating theory as our observations and interviews". (Glaser, & Strauss, 1999, p. 163). The same authors describe in great detail the advantages and disadvantages of library materials. (Glaser et al., 1999)

Turner (1978), has based his Grounded Theory research about disasters on official accident reports. In spite the fact that, in the aftermath of Entre os Rios disaster immediate (and somehow concurrent) official Commissions were appointed

to investigate its causes, at the beginning of this study no findings were available making this an impossible means.

Although our literature review on accidents was undertaken at a much later stage of the research process, and obviously much after sampling decisions had been made, we think some writers' opinions about the issue should be usefully included here.

Most readings came to demonstrate that official reports could be rather misleading too. In addition to being designed towards attribution of responsibility and blame, other critics to those documents (Reason, 1990, p.16) stressed they always mention insufficient data and linearly describe what in reality had been a complex set of "analogue" events. Perrow (1999, p.384) reports a study by Leo Tasca proving the highly biased nature of apparently above suspicion reports from government bodies.

An exceptional and almost unique case is Judge Mahon's "Verdict on Erebus" (Mahon, 1984) nowadays considered a hallmark on the organizational investigation of disasters, but initially banned by authorities and only 20 years later officially recognized by New Zealand's Government.

Sagan (1993) citing Normal Accidents' Theory (NAT) also calls attention to using document sources produced by organizational players who are looking for self-defending their interests.

Turner (1978, pp.10-11) presents a table with a "Summary of Western's classification of sources of accounts of disasters and some of his main comments" which provides a general picture about this problem.

The fact that Nørgaard (2001) has based her doctoral dissertation on scientific papers published in "Harvard Business Reviews" also illustrates how the concept of documentary sources can expand, within applied Grounded Theory methodology.

This notion, associated to the ethical issues already mentioned, led to our option to use another kind of documentary sources: newspaper articles, a document source also cited by Glaser et al. (1999, p. 170) among useful library materials.

This choice is not without problems, some of which will be stressed bellow.

First, such writings are not without biases, many of them resulting from power and politics' influences.

Second, newspapers sometimes tend to explore the most theatrical sides of events, instead of focusing other existing perspectives for the same issue, because of sales figures, for instance (Toft, & Reynolds, 1997).

Third, usually journalists do not have enough time to undertake exhaustive and accurate data research before writing, due to the constant pressure of publishing deadlines (Sousa, 2000).

Turner, also refers journalistic accounts of disasters, dismissing most of them as “partial, distorted or sensational” but exempts some sort of journalism (one we now call investigation journalism) which, by concentrating on a single story and with persistent investigation, he believes able to provide useful information dossiers. (Turner, 1978, p.14)

On the other hand, such documentary sources also present advantages, not only for the present purpose, but also in a more general point of view.

First, they are publicly available, which, although being a matter of researcher’s convenience, also guarantees unrestricted documentary access, a situation seldom completely achieved whenever there are archives (organizational or individual) on stake. Furthermore, some useful and unexpected archival data sometimes happen to be mentioned by this means, while being otherwise difficult to identify.

Second, although indirectly, they often convey the testimony of many participants. This is particularly useful when interviews are excluded, such as in the present study. Sometimes this sort of contact is registered so soon after the event, that testimonies may still be regarded as more spontaneous and natural, being generally acknowledged that rational justifications appear gradually later on and often act as self-defence barriers.

Third, printed press includes publications with different periodicities, which also means papers’ preparation time. Newspapers and magazines have specific contents profiles, and often style characteristics, of their own. Besides, within each publication there are always several different contributing persons, whether regular journalists, columnists or invited contributors, who provide a diversity of tendencies and insights.

These factors altogether make us believe that newspaper articles can be rich vehicles of information and thus constitute useful documentary sources.

### *Research process*

We want to stress here, that data sampling and collection phase were clearly accomplished out of the Grounded Theory criteria. Strict obedience to the Grounded Theory principles would recommend the collecting of a few articles, working upon them, comparing data and sources among themselves and than moving to another

collection of articles, in a recurrent collection and analysis move according to the research's own developments (Dey, 1999; Locke, 2001).

In the present case - taking into account the well-defined type of documentary sources chosen as sample as well as their gathering process – the assumed option was to collect the most before analysis.

### *Sample*

One major Portuguese newspaper, “O Público”, was initially chosen as the sample, where from articles would be analysed, considering it is a major national daily news journal.

However, this initially focused purpose was expanded so as to include news related to the disaster that were also issued on a major weekly journal, “Expresso”.

This wider choice represented an enrichment of the analysis on the following grounds: it is obvious that publishing periodicity has a major effect on the selection and treatment of journalistic information. Therefore, different choices are to be done between a daily and a weekly publication (whether being on paper or digital support) when it comes to subject selection and writing (Cascais, 2001).

Another sampling decision was the time span for this study, (i.e.) which dates to include on the analysis from the very first lines referring to the disaster. Entre os Rios keeps being discussed nowadays, and each reference to any of its Commissions' new results still calls for headlines.

We chose to include articles from the disaster onset date (4<sup>th</sup> March 2001) until the end of that same year.

References to the disaster were frequently made during all this period as it was elected as one of the few important events of 2001. Another advantage of such time span, was registering reactions more close to the disaster as well as more elaborate commentaries, arising from some distancing in time.

### *Data Collection*

The first move towards searching the subject of Entre os Rios disaster in newspapers' articles was made through the Documentation Centre, Centro de Documentação e Informação (CDI) of “O Público” and later on, also the CDI of “Diário de Notícias” (another major daily newspaper) also to retrieve articles edited by O Público as explained later.

This was a new personal experience and the expectations that, similar to libraries, these CDI would allow users' database search within their premises, proved wrong.

Although with some automation degree differences between each other, both CDI provided "press dossiers", Dossiers de Imprensa (DI) organized by main subjects and events, and primarily intended to assist resident journalists on their work. In what refers to the Entre os Rios disaster (whose impact has already been mentioned), there were specific DI with abundant documentation.

One particular feature of the DI, is the fact that they collect not only the articles published by the journal to which the CDI belongs to, but other articles published by external newspapers and magazines (some foreign), whenever considered of relevance to the overall dossier information. This enabled cross-matching of the articles published by O Público on the disaster, that were included in the DI organized by its own CDI, with those included in Diário de Notícias' DI. This step, although lengthy, proved helpful because it recovered some articles that were missing, and therefore granted more exhaustive collecting.

In what refers to "Expresso", this weekly journal allowed free Internet searching of its articles at <http://online.expresso.pt/pesquisa/default/asp> a feature that was used. It enabled retrieving all articles related to a subject whether from the main journal or its associated supplements and magazines. All journal issues thus identified as heavily related to the Entre os Rios disaster during the period under study, were bought in original paper form from the journal's bookstore, while other sparse articles were printed from the Web.

#### *Article inventory and identification*

The gathering of so many articles required an organized way for their registering and identification.

This was addressed by using the features of a spreadsheet. All collected articles' references were inserted using the following parameters, whenever available: date, source (original publication), main title, author(s), page and finally an identification reference assigned to help on future citation of each article.

This identification reference or unique identifier (intended as libraries' "call numbers") was created so that it would include some straightforward and useful information data: alphabetic initial identifying the DI or database where the article was collected, numbers indicating the publication date, acronym attributed to the journal or magazine where that article was released, and initial words of the title.

After that work, all redundancies were eliminated and many lacking elements completed.

One of the advantages of choosing a spreadsheet is its sorting ability, which was used to split the global listing by information source. Articles analysed from O Público and those from Expresso are listed on Appendixes A and B.

### *Data Analysis*

The choice of Grounded Theory poses some uncomfortable issues that have already been addressed in this text.

The construction of a sort of research guideline with the aim of assisting in the steps to follow, and based on the extensive reading about the method, proved a very useful option. At many points, it required a careful evaluation of different conceptual positions to select those procedures judged either more accurate or more appropriate to the present purpose. Besides the fathers of Grounded Theory, most orientations were extracted from the works of Dey (1999) and Turner (1978).

Because this research came to be more extended in time than expected, such a working basis assured to the researcher some sort of consistent guidance throughout a much loose process.

The steps that were undertaken are described in detail in the text to follow so that the outline used, thus becomes comprehensible to the reader.

The **first** step was an analysis of all selected articles identified as linked to the Entre os Rios disaster that were published in 2001 in a major diary (O Público) with 190 pieces and a major weekly (Expresso) with 51 pieces. Therefore, Open Coding analysis was undertaken in a total of 241 journal articles, each considered as an entire piece of information to be analysed.

During this phase, two simultaneous operations were systematically carried out:

One, the creation of cards one for each of the articles, headed by the unique identifier attributed to the article being analysed. All subjects judged interesting for the analysis that were retrieved in a single article, were registered on such card. These subjects were mentioned in the form of "labels" that, so far, were considered preliminary and imperfect. New labels received a sequential number, corresponding to the chronological sequence of their creation, and thus linking the article's reference to its contents. A photocopy of one article card sample is shown as Appendix C.

Tools used were A5 handwritten cards and their filing followed the sequence of analysis, (i.e.) identical to the spreadsheet chronological sorting of articles for each journal.

Another, simultaneous operation in this second phase was the generation of a similar set of cards, one for each of the Open Codes that were created. Those excerpts of the article best thought to illustrate and justify the inclusion or creation of the label, were transcribed on such cards. The article's unique identifier was always mentioned, so as to enable later location of the quotations. A photocopy of one Open Coding card sample is shown as Appendix D.

Tools used were A5 handwritten cards, and their filing was by alphabetical order.

Another procedure also took place from this phase on. It occurred at any moment of the investigation and thus encompassed various research phases. It aims at registering any of the researcher's thoughts, questions and notes in Memo cards, sequentially numbered as they were produced. When Memos were generated from an Open Coding concept, that specific concept's card would mention the Memo card number, to facilitate linking.

Tools used for memoing were also A5 handwritten cards, that were arranged by number sequence. A photocopy of one memo card sample is shown as Appendix E.

Although all articles were the object of our analysis, some of them did not generate any card. This happened whenever their content did not bring any relevant data for the research purpose.

After Open Coding, 41 Open Concepts had been produced. Most of the 41 corresponding cards aggregated several pages (i.e.) cards, under a same open code.

Those initial open codes were recorded on a word processor list, with some primary notes about their contents. [Appendix F]

It became necessary to review and reduce those concepts, which was achieved through several concurring processes, all within a next research step.

The initial phase had been time-consuming and therefore it became indispensable to read all cards and re-check their contents.

Such extensive re-reading of both concept cards, and memos, had the advantage of facilitating at this stage the creation of a by-product, which neither had been envisaged beforehand, nor was methodologically required, although it came to constitute a **second** step in this process.

Profiting from this re-reading process, many factual information and dates that were scattered and partially mentioned over the two hundred and forty five articles,

were now pulled out from the cards. After their chronological ordering, a chronological register was produced in the form of 3 documents, organized in accordance to 3 subject areas recurrently mentioned in the newspaper articles of the Entre os Rios disaster: overall management of "obras-de-arte" in Portugal; specific management of the bridge of Hintze Ribeiro; overall management at the Douro River.

These documents compose a sort of framework for the Entre-os-Rios disaster and proved very useful later on. They were listed using simple word processor, and are shown as Appendix G, H, I.

**Third phase:** At this point and directly related to the aim of evolving from the first concepts, a table was made listing all 41 Open Codes where their main features were concisely put in. Besides the concept (and referral to other concepts whenever judged related), this table registered data regarded as more important from its contents (actions and agents), and wording (terms) more frequently employed in the articles used as source, and therefore judged to best contribute to the concepts' characterization. On the very right column, some notes about each open code concept were added later on: suggestions about whether elimination should be envisaged or subdivision of the open code, or instead, aggregation of several related concepts into a single one, or even the creation of a new phrase formulation to substitute the preliminary open concept.

The tool constructed at this stage was a straightforward word processor table, hereby shown as Appendix J.

This synthesis-table greatly assisted in further analysis, for it allowed not only a global perception of the main features registered by then, but also a cross-visualization of all data, which was hardly possible by means of the detailed Open Concept cards.

The **fourth** phase had several aims:

One of them was the exclusion of all Open Concepts that presented poor explanatory power, lack of occurrences, (i.e.) low level of data registered, or were considered of secondary interest to the subject under study.

Other aims were the aggregation of concepts considered somehow duplicated, and also the splitting of those that were heavily overloaded.

At this stage, a first attempt of code ordering and prioritisation as well as of very preliminary code groupings would occur. From the notes of the synthesis-table, this step undertook concept aggregation and evaluation (handwritten) and directly eliminated 12 on a first approach. A second more elaborated approach further

reduced 6 entries, getting to a new total of 23 Open Concepts. However, those concepts still kept their initial unrefined description.

Transition into new labels, although only applied to some of the open concepts, also happened for the first time, and was registered by means of another word processor table that was entitled as "further analysis of open codes". [Appendix K]

This new table mentioned each of the 23 open codes that had passed beyond the initial phase, followed in the same line by the reasons that suggested an eventual reformulation, splitting, fusion or maintenance of the concept. Possible links among concepts (opposite, related, broader, narrower) were also registered. The final outcome was noted down on the right column, grouping all new labels that resulted from this work.

This phase achieved a total of 19 labels, still considered as Open Codes, although some had been rephrased in a less conversational style than before. Some authors (Goulding, 2002) consider this step as a kind of preliminary conceptual categorization.

At this point, the methodological condition referred as category saturation (Strauss et al., 1998, p.136) was considered achieved. According to Dey (1999) that is the moment where data stop generating new ideas, and where categories are not further developed by new data additions.

The goal for the next, **fifth** phase, was to define each code in accordance to the characteristics and qualities that had been implicitly recognized and identified so far, in the source-articles that had originated the creation of that specific label. Although sometimes described as abstract, such definitions develop unequivocally from the substantive case, and are not generalizable. The final product hopes to embrace explicitly and consistently the main features and situations behind the label, therefore enabling a thick comprehension of the coding, although one directly embedded in the case.

The result was also recorded on a word processor table. [Appendix L]

The **sixth** phase of work meant to move towards a conceptual definition.

This stage was a very complex one, requiring constant interaction among data, definitions and thoughts. If ever Glaser's phrase about Grounded Theory requiring "a tolerance for feeling out of control" (Glaser, 1998, p.11) was applicable to this research process, this was the phase where it was felt as more appropriate. The purpose of raising thoughts and words emerged from a particular setting (and still linked to it), in order to bring them to a higher, broader and extensive level of analysis is difficult and demanding.

At this stage, different processes often happened simultaneously, most were associated and the researcher's focus kept moving back and forward. However difficult to distinguish while occurring in practice, they will be independently described for the sake of precision. They have been considered as jointly integrating this same phase of work, because of their constant interplay.

A preliminary inter-conceptual distinction between categories, properties and dimensions was to be carried out, a procedure that was mainly assisted in the present study by the theoretical orientations offered by Dey (1999) who provides a valuable clarification of these designations, as well as a useful reference to the analytical processes underlying each of them.

Another aim was the systematic transformation of those concepts and categories into more abstract entities. Such a conceptual formulation hopes to proceed gradually from the level of the substantive case, until reaching a more abstract formulation level.

A provisional set of the properties and interrelated categories was generated. Thereby, some very preliminary and very basic hypothesis emerged.

Constant comparison with data, always recommended in Grounded Theory, was present and helpful throughout this phase. Also, the methodological recommendation to review and develop data analysis considering the definitions produced in the previous phase was followed. Information registered on table already shown as Appendix K, was thus regularly explored and considered very useful to the purpose in view.

Another closely interlinked process occurring at this same phase was the exploration of categories. Guiding aids used for this purpose were some of the focus for analysis pointed by Dey (1999), either based in Bernard Glaser's or in Strauss and Corbin's different views and tools to help in the identification of processes<sup>1</sup>.

In spite of all written support, it was a very uncertain process and developing at irregular pace as well. One particular difficulty that deserves mentioning, was keeping the sense of balance between a more spontaneous, eventually less conceptually organized application of the method, and another one, close to the theoretical definitions and thereby more structured.

<sup>1</sup> Processes constitute an essential component of the theoretical basis of Grounded Theory and "represents the dynamic and evolving nature of action/interaction". (Strauss et al., 1998, p. 179)

The outputs from various steps of this whole work phase, were recorded from the very beginning on a series of word processor documents. The fact that 4 different versions of such document were produced during this particular stage of work, may give an approximate idea about the complexities that were faced during the analysis. [Appendix M]

As a parenthesis, we wish to mention here that, while working at the diverse presentation forms taken by this table, English language concepts were first introduced along with their Portuguese equivalents. By then, it was already clearly felt that English language provided better concision and descriptive power to the conceptual headings as well as could anticipate an easier confrontation to the literature (almost totally English-written), an essential part of the process to happen on the very next phase. Vocabularies were thus kept in bilingual presentation to enable easier linking to the initial open concepts until the 6<sup>th</sup> version of the same document, the last before literature confrontation. From that time on, English version prevailed.

However, the decision to write the dissertation text entirely in English was not directly connected to this phase, but came later also as the result of this.

The **seventh** stage of the research process aimed at the transition to an initial hypothetical level, through tentative links between identified categories. At this stage, all concepts, properties and dimensions that had been referred so far, were for the first time ordered in accordance to the notions of initiating, contextual and intervening conditions, as well as their putative outcome.

Some of the logical links became more easily evident than other. The same occurred with causal relations.

The call for attention by Dey (1999) about the importance of plain common sense and the knowledge of how things happen, was precious to this phase and once again required checking with data.

The results during this phase of work are recorded in further versions of the word processor document above mentioned, now at its 6<sup>th</sup> version, as a result from the several stages of the conceptualisation process completed so far. [Appendix N]

Leaving aside the research data to turn to the scientific literature on the field of error, failure, accidents and disasters, was the next and **eighth** phase of this work.

During this extensive reading process, some additional works came to be added to the initially collected bibliography. Some looked forward to enriching the specific disaster literature, other represented theoretical and conceptual frameworks to which recurrent reference was found in the readings, thereby compelling to their examination as well.

As the reading phase was developing, some interesting, interlinked developments with our previous data took place, which deserve proper mention.

Terminology was an immediate one: in many cases, vocabularies were productively substituted by other expressions, more commonly used in the published documentation being studied.

It was particularly motivating to discover that there were many grounded concepts that had emerged from this case, which had counterparts in the form of conceptually relevant and well-known designations in the scientific literature. Whenever theoretical concepts, already coined as scientific valued terms, were judged equivalent, and thereby more appropriate to provide insight to the case, they were applied.

This was not always a straightforward terminology operation, but eventually brought about an array of other conceptual rearrangements. Keeping some dimensions that were already established as making part of those scientifically recognized concepts, seemed redundant and useless, thus becoming the most frequent reason for such rearrangements.

This is obviously connected to the recurrent fit that could be established between many features of the Entre-os-Rios accident and a great number of cases that were referred in the literature studied, in spite of their different settings and dates.

The great impact this newly absorbed theoretical focus had on the present study, also had another opposite, though equally interrelated side, the ways the substantive case did not fit into some of the theoretical theories examined.

Time taken by this new phase of literature reading, forced to some occasional data re-checking. The factual sheets mentioned before as a "by-product" generated during the second phase of research, were very useful during this particular kind of data comparison. At this point, a sort of outline umbrella chronology was also organized and facilitated from a simple internet search in the Portuguese government site ([http://www.portugal.gov.pt/Portal/PT/Governos/Governos\\_Constitucionais/](http://www.portugal.gov.pt/Portal/PT/Governos/Governos_Constitucionais/)) with the aim of contributing to the location of events, as they developed in time. [Appendix O]

After theoretical confrontation of grounded data and published literature, a new, hereby considered as **ninth** phase of analysis occurred, aiming at verifying relationships among the main categories previously established throughout all this constantly connected and upgraded research process.

Many authors either defend (Goulding, 2002), or apply (Cunha, 1999), different models of diagrams as useful tools to assist in the presentation of such processes

and relations. Considered as a sort of causal model of relations, a diagrammatic causal model was therefore constructed and considered as a valuable means to obtain an explanation of the subject under research and concurrently assist in the emergence of core categories.

The main purpose of such model was to achieve theoretical integration, thereby facilitating the basis for the theoretical statement of the research. Because this model is closely related to the discussion of the findings, it will be presented in the next section of this text.

This led to the **tenth** and final stage of our study. The goal here was to connect the grounded findings emerged from this particular research with the overall repository of scientific data in this area, aiming at the generation of new ideas.

Clearly, this final phase became a key one, as the researcher intended to achieve linking among all diverse issues, tools and phases previously generated.

Interlinking literature findings, the causal model and the conceptual organization under initial conditions, mechanisms, internal context, intervening conditions, phenomenon and outcomes led to further rearrangements of the table already mentioned as Appendix M. It was again modified from the eight phase onwards, until reaching what was finally considered to be a satisfactory understanding of the emerged findings. This is shown on Table 1, at the beginning of the Results section.

To assess that our specific grounded findings were not lost during the theoretical process we checked actual theoretical concepts (categories, properties and dimensions) against the 19 open concepts emerged from the 41 preliminary ones and confirmed that they were all represented into new labels.

Although further steps in the research process, such as presentation of a grounded model and considerations about nuclear (core) categories could also be included into this section, we chose to postpone them until the end of next section, the presentation of results. As they come as a logical sequence of findings, we think they will gain from better hindsight if located at that point of our text.

As Turner (1983) stressed in one of his Grounded Theory guiding articles, quality of the result in Grounded Theory is much more dependent on the understanding by the researcher of the phenomenon under study, than in many other kinds of methodologies.

Whether the incorporation of the researcher's ideas and thoughts into the rich and relevant scientific literature studied produced any theory, either "substantive" or "formal" (Dey, 1999; Locke, 2001) that can be considered as new and relevant regarding the subject under study, will be judged in the next part of our dissertation.

## RESULTS

Because of the specificities of Grounded Theory, its findings do not follow a single pattern of presentation, thereby offering to the researcher less guidance and support, albeit allowing more freedom in this matter.

The few collected academic dissertations, that were expected to work also as orienting models in this matter, had undertaken quite different field applications of Grounded Theory principles. From this, further variance was added to their texts. The fact that their authors came from different national cultures, worked in different research areas, did their research in different times and presented their thesis to universities from different countries, may also have contributed to the overall variability.

The theoretical conceptualisation of these works, once more illustrates how many diverse perspectives can be included in the academic recognition of what constitutes Grounded Theory research.

Turner (1976b) presented all categories that had emerged from the analysis, providing an “umbrella construct” thereby considered the core finding. Correia (1996) organized an axial model from the categories emerged during her research, and established a core concept. Cunha (1999) described constructs, categories and variables and, from their diagrammatic correlations, achieved a grounded model for his findings. Nørgaard (2001), mainly described categories and dimensions originated from her analysis, made with the assistance of specific computer software.

It is against such framework that our presentation of results will be developed.

We will start by inserting Table 1, the final version of many previous conceptual steps occurred during our research analysis and thoroughly described in the Methodology section.

Final Concept Categorization	
CATEGORIES	DIMENSIONS
<b>"CAUSAL CONDITIONS"</b>	
Government influence over organizations	Central Power re-engineering decisions Recurring Setting changes Responsibility and accountability levels
<b>"MECHANISMS, STRATEGIES"</b>	
Organizations' legoing and colage	Shifting of organizational relative positions Level of roles' readjustments Clarity of responsibility mapping
<b>"INTERNAL CONTEXT"</b>	
Regulatory framework impact	Cross-institutional clustering disregard Inter-organizational overlapping areas Inter-organizational empty areas Degree of adequacy of regulations Resources' allocation level Recommendations' implementation level
Front and back span	Controlling / Controlled interplay Degree of conflicting interests "Power Distance" Central versus Local politics Organizational top versus front-line
Global/Local climate changes	Isolation Extent of outsiders' silencing Unusual weather conditions Increased rain levels Increased flood levels

**CATEGORIES**

**PROPERTIES**

**DIMENSIONS**

**"INTERVENING CONDITIONS"**

"Failure of foresight"

Drifting management

"Stuttering" planning  
Evanescent decisions

Communication/Information difficulties

Flow barriers  
Content barriers  
Lack of interaction

Illiteracy to hazards

Low learning aptitude  
Limited warning awareness  
"Decoy events"

**"PHENOMENON"**

Boomerang management

Development of backfire strategies

Drain of expertise  
Drain of experience  
Legal framing of illegal practices

Imposition of artificial fixes

Implant of power-staff into technical core  
Outsourced core-knowledge dependencies

Acceptance of facilitating practices

Embedding of "practical drifts"  
Pervasive rule enactment

Enabling non-sensemaking

Loss of institutional "durée"  
Limited knowledge availability

**"CONSEQUENCES"**

Organizational disaster synergy

Error prone organizations' conjunction

Agents' interplaying unawareness  
Disjointed responsibilities' perception

Nature/Organizations' interplay

Accident probability increase  
Accident potential dimension increase

*Presentation of categories, description of their properties and dimensions*

While the overall list of concepts, categories and dimensions is shown on Table 1, each category will be explained here through the properties and dimensions that justified its conceptual relevance in this case.

Some of the concepts were created, while others were adopted from scientific literature, whenever appropriate. Making use of constructs from previous researches that had the fortune to combine terminological impact with new relevant conceptual findings was considered natural, desirable and even mandatory. Their paternity will be legitimately attributed in the following section, where literature confrontation and discussion of the findings will occur.

Because results emerged from a grounded analysis, they will be continuously embedded in the case. In order to establish the link to the corresponding source-articles, each cited article is referred by its specific call-number or reference code. Their construction and interpretation has been described before at the "Article inventory and identification" part of the Methodology section.

Not all articles that addressed each of the topics will be mentioned, only those judged either as more illustrative or as more explanatory in the light of the specific concept being addressed. Relevance was favoured against exhaustivity.

Transcription of the parts being referred was judged necessary. However, including here extracts of the source articles, would undesirably expand our text and thus prevent a more easy visualization of results. Therefore, we chose to present them as Appendix P. To allow easier verification, quotations will keep the same order as they appear in this section.

Government influence over organizations

The property of "*Central power re-engineering decisions*" is further specified through a first dimension of "Recurring setting changes". This concept was identified both in what refers to national bridge management and to sand extraction and controlling at the Douro River, two different domains that will be often called upon during this work. Those deep organizational changes included, among other features, transference of hierarchies among ministries, institutional extinction and splitting of previous roles into new organizations, head persons' replacement and organizational exchange of responsibilities. The way this happened in time is better illustrated by a document already shown as Appendix N. Among the various articles in the background of these concepts' generation [Ex010310EXdequem] and

[Pbd010306PUBLfalta] about Roads and Bridges' management and [Ex010317EXPareias] referring to the Douro River, were chosen as representative. The second dimension "Responsibility and accountability levels" was grounded in many of the source documents. Slack responsibility and low levels of accountability are often cited as an overall national cultural problem involving organizations and individuals and intersecting all domains of activity. [Pbd010305PUBLirrespons]; [Pbd010309PUBLaosabor]; [Ex010310EXPdequem]; [Pbd010315PUBLestado] On an ex-post situation the frantic discussion over responsibilities pointed at a higher level led, to one minister warning to a confusion between responsibilities for the disaster and its causes. [DN010315PUBLtomada]

#### Organizations' Legoining and Colage

This construct is based on two properties. The first one, "*Shifting of organizational relative positions*" addresses the hierarchical new adjustments expected from such extensive organizational rearrangements. It is approached by two dimensional concepts "Level of roles' readjustments" and "Clarity of responsibility mapping" both related to the degree of explanation and intelligibility that was associated to those major organizational changes. The substantive case points to the occurrence of a low degree of clarity in either dimension. This was noticed for the Roads and Bridges domain [Pbd010307PUBLconservaç] and also for the Douro river sphere where, after the accident arguments arose between ministers of Environment and of Social Equipment about the scope of jurisdiction that each of their institutions had over the control of sand extraction. [Pbd010309PUBLind]; [Pbd010310PUBLsócratesna] In the aftermath of the disaster a maritime officer first arrived at the settings, soon recognized not being clear who would be the coordinating body for rescuing operations, once there existed several authorities with jurisdiction over the river. [Ex010310EXPcastelo]

The second property "*Cross-institutional clustering disregard*" develops from outcomes at another level, those that involve cross-linking among independent institutions. This concept is based on two distinct but equally potentially hazardous dimensions. Both can be found in the Entre os Rios case. The settings of the disaster are by themselves an illustrative example of a complex organizational interplay. Concurrent jurisdictions over Douro River (margins, sand extraction, navigable water stream, ecologic impact) [Ex010317EXPareias] while allegedly distinguishable in theory, in practice became eventually difficult to establish, thus grounding the "Inter-organizational overlapping areas" dimension. However the other dimension – "Inter-organizational empty areas" – must also be considered here. The bridge was a specific social equipment which, although under the specific

authority of the national institute of roads (IEP), also crossed over a river important enough to raise the questions that were mentioned in the previous topic. In spite of this, no reference was found to the existence of any kind of articulation among those different bodies. Our evidence is grounded in the absence of articles at this point. There is reason to believe that, from such required domains-integration level, the bridge of Hintze Ribeiro was nobody's land. A possible exception that was noticed within the framework of Douro river management system, is the reference to an intended Plan to assure safety of border and cross-over constructions, such as bridges. Another one is an aborted alert from IEP (Roads and Bridges) to DRAN (Douro River) following the 2000 report on the Hintze Ribeiro Bridge condition. Both incidents apparently had no consequence. They will be specifically addressed later, with their corresponding article quotations. The first one [Ex010317EXPareias], cited under Regulatory framework impact / Controlling agencies' empowerment and accountability and the second one [Pbd010310PUBLinstituto], cited under Failure of foresight / Drifting management.

#### Regulatory framework impact

It is important to recall here that, in the present case, both IEP, while operating on the area of Roads and Bridges, and IND, DRAN and CPD over Douro River, were controlling bodies.

This category raised out from two properties.

The first one, "*Controlling Agencies' empowerment and accountability*" was dimensioned in three concepts all tightly connected in this case, as illustrated on one of the source-articles. [Ex010310EXPchegou] Criticism in this subject seems to encompass several years. [Ex010310EXPrelatório] The "Degree of adequacy of regulations" dimension comprises not only the non-existence of regulations but also the level to which available regulations corresponded to the aims they were intended to address. This emerged from points made in articles whether addressing IEP or the various intervenient organizations around the Douro. The existence of a «Regulamento de Segurança e Acções para estruturas de Edifícios e Pontes» (published as law in 1983) was reported, while referring it did not address the question of time intervals between inspections neither mentioned the liabilities for non-compliance with the rules... [Ex010310EXPchegou] In what refers to the Douro River the situation may be considered analogous. Both a Norm of the Ministry of Environment and a Law on the use of the water domain were pointed out as the written rules that supported many of the institutional actions in this area. However, allusion is also made to a future Plan, yet apparently non-existent, intended to address the safety of constructions on the borders and over crossing water.

[Ex010317EXPareias] This was already previously referred in this text. A second dimension named “Resources’ allocation level” is closely linked to the previous one. However appropriate any existing regulations may be, regulating bodies cannot achieve their goals if they are not provided with the necessary means for that. Mentions were made to an overall gap between resources and necessities [Ex010310EXPquestão]. Specifically referring to the Roads and Bridges’ field, severe lack of staff is reported since the last operating period of the predecessor institution, JAE. Allegedly, this was among the several factors taken into account when organizational re-engineering was undertaken, an issue that will be addressed later in this section, at Boomerang management / Development of backfire strategies. By the time the collapse occurred, IEP was cited to have insufficient means [Pbd010308PUBLháfalta] admittedly affecting their institutional controlling role performance [Pbd010308PUBLnenhuma]. In the river domain there is a mention to DRAN being compelled to trust arrested boats to their owners because there were no conditions to keep them apart. [Pbd010313PUBLlegislação] “Recommendations’ implementation level” came out of the logical confirmation that activities which were assumed to be under any form of control, whether bridges or sand extraction, were not incorporating many of the existing regulations often, but not always, because of what was described in the previous dimension. A first mentioned inspection to JAE, in 1994, among many other critical issues, already detected failures in the inspections. [Ex010317EXPrelatório] Both JAE and IEP did not implement specific recommendations that were issued for the Hintze Ribeiro Bridge at different years. [Pbd010316PUBLjae] This dimension also refers to the application of sanctions as described in a source-article, where the ingenious techniques used by sand extractors to elude control penalties are described.[Pbd010313PUBLlegislação] A global condensed picture of the issues referred in the two activity domains that are being analysed also exists. [Ex010310EXPchegou]

The second property, “*Controlling/controlled interplay*” has a single dimension emerging from the “Degree of conflicting interests” that involve both regulator and regulated bodies. An extreme illustration, were accusations of corruption at the road and bridges’ domain. Those were the main reasons given to order an investigation to JAE that occurred in 1998 [Ex010310EXPdequem]. Amiable relations between sand extractors and controlling agencies, such as DRAN and CPD, were specifically reported when alluding to the many ways regulated parties used to pass over legal impositions. [Pbd010306PUBLcadaum]

### Front and back span

This category was constructed from two properties. The first one "*Power distance*" got its dimensions both from the perspective of Central versus Local power and politics and from the organizational gap between top level management and front level operations. "Central *versus* Local politics": The theme of a constant confrontation between Central Government together with his more significant representatives and local authorities and citizens was recurrent in the source articles although sometimes it was kept as a sort of back screen to other more prominent questions. This "guerrilla climate" was reported to exist from many years ago. For this region to have attained such a deep state of isolation requires a look far back into the lack of relationship between local and central power. [Pbd010315PUBLfaltou] Local citizens, headed by their directly elected mayor, were pressuring Central authorities for a new bridge. The regional representative of Central Government (Governador Civil) neither supported the same kind of priorities, nor agreed with the existing civilian influencing movements. Those conflicting perspectives came from differences at the election level, translated into central or local administration representing authorities who, in this case, were aggravated by the fact that they were from adversary political parties. [Pbd010315PUBLpecados] The other "Organizational top *versus* front line" dimension is more focused on organizations and simply admits common knowledge features of a centralized, hierarchical administration structure. Occasionally this gap would emerge in some way from texts, like when top hierarchies formally assured that illegal sand extractions had ceased since 1997 in spite of IND's 1999 reports referring to the maintenance of that practice. [Pbd010313PUBLareeiros] This goes without mentioning actual testimonies of the same reality. [Pbd010313PUBLgovernonega]

The second property is "*Isolation*" and this was the genuine word recurrently employed in many of the articles. [Pbd010306PUBLconcelho] It was dimensioned by the "Extent of outsiders' silencing". This concept intends to mean much more than any geographical or physical distance and non-communication. [Pbd010315PUBLcatelo] It is somehow expressed in one of the articles that describes it as being not a physical but a political and institutional kind of distance. [Pbd010315PUBLpecados]. The fact that during the regionalization campaign in Portugal this very region (Concelho de Castelo de Paiva) had been previously referred to as a most paradigmatic example of administrative deregulation, cannot be eluded here. [Pbd010315PUBLterra]; [Pbd010315PUBLpecados] It stresses a particular kind of isolation where people are not listened to, and come to be

forgotten. Whether these interior northern communities were intentionally put aside from European's investment money out of the scarce number of electors was even mentioned in some articles [Pbd010315PUBLestamosa]. It is worth mentioning here that, in the aftermath of the disaster, there was a delay of about 24 hours in the rescuing operations because this administrative region did not have any of the usually established mechanisms of civil protection. Therefore, calling for the right authority (Marine Authority) took a whole day more than it should under normal, (i.e.) non-isolation circumstances. [Ex010310EXPcastelo]

#### Global/local climate changes

"*Unusual weather conditions*" property acknowledges this being a year of heavy rain and strong flood described in its 2 dimensions, "Increased rain levels" and "Increased flood levels". [Pbd010306PUBLponte]; [Ex010310EXPinverno] Those particular conditions were frequently cited and often associated to the bridge collapse.

#### Failure of foresight

This well-known academic construct was applied here, as it appeared to provide the most adequate conceptual wrapping to the 3 properties emerged from the present study.

The first property is "*Drifting management*", a concept considered appropriate to label two dimensions that emerged from important features of the case. "Stuttering (an imported term accurately describing a sort of arrhythmic and incoherent movement) planning" was found for instance in the Roads and Bridges domains. An international competition designed to enable a nation-wide plan conceived to answer to the needs of bridge safety assessment, was abruptly closed. This happened after significant work had already been done in launching the tender, and immediately before publishing the ranking of firms that had applied. [Ex010310EXPrelatório] It is worth mentioning that, among the extensive and detailed specifications, one of the obligations of the winning firm would be to produce a manual with procedures for bridge inspection. [Pbd010315PUBLgestão]; [Pbd010314PUBLsangria] "Evanescent decisions" is another dimension grounded in several statements, among which JAE's presidential order (of 1993) authorizing the construction of a new bridge for urgency reasons. Particularly significant is the episode of an urgent dispatch from IEP (President?) to be immediately sent to DRAN alerting to hazardous issues that were reported in the 2000's inspection of the bridge. This fax was never sent. The fact that IEP's Northern region director retired by then is mingled with this episode but in reality nobody knows the reason why, neither the urgent message, nor the procedures it should trigger, ever came to happen. [Pbd010310PUBLinstituto].

The property of "*Communication/Information difficulties*" is a widespread recognized feature in many organizations. "Flow barriers" and "Content barriers" are obvious dimensions behind some of the documented situations. They were connected to issues already addressed before such as power distance, clarity of responsibility mapping. Ambiguities were pointed even at the level of written rules and law. For instance, it is mentioned not being clear whether the new institutes were intended to be a solely business structure or still keep an administrative attribute. [Pbd010310PUBLtribunal]. The "Lack of interaction" concept was considered to be a specific dimension, resulting from non-communication situations in practice. It occurred in conflict situations, as those arising between local and central government representatives over the bridge collapse that were reported above. It occurred even in unexpected situations, as the one mentioning that difficult personal relations between the President of IEP and his hierarchical superior, the minister of Equipamento Social, led the former to directly meeting and reporting to the prime minister. [Pbd010306PUBLpressões]

The concept labelled as "*Illiteracy to hazards*" is a property came out of three dimensions. It is directly related to the inability to decode signs and thus be prepared to face unexpected or surprising events. In the immediate aftermath of the accident the Ministry of Social Equipment (through the office of the secretary of state) made a statement declaring that there was absolutely no prior information about the risk of collapse and that the last inspection had not registered any sign of ruin. [Pbd010306PUBLvisita] The first dimension, "Low learning aptitude", emerged from public criticisms pointing to previous national examples, considered as comparable to the Entre os Rios accident, and yet never incorporated as organizational learning. [Pbd010305PUBLirrespons]; [Ex010317EXPlições] "Limited warning awareness" refers to a specific problem identified in organizational studies in this area. Here, it was often connected to other issues, some of which have already been referred, such as outsider's silencing and communication difficulties. It is interesting to observe that many informal or semi-formal alerts (like the many ones from local community and authorities) were disregarded in this case. [Pbd010306PUBLdesastre] On the contrary, a citizen's letter directly sent to the minister of Obras Públicas (later Equipamento Social) originated a technical examination of the bridge resulting in a "Technical report with Recommendations" which was the root for the urgent never-sent message previously referred. [Pbd010310PUBLinstituto] "Decoy events" is another well-known coined concept that is perfectly adjusted to the grounded findings. One of the earliest mentioned inspections (1986) to the Hintze Ribeiro Bridge produced a technical report with

several recommendations that were planned to incorporate an important engineering intervention. Meanwhile, pressure of local authorities to the construction of a new bridge is reported. This new and different line of intention brought as a consequence that the prior technical recommendations were abandoned. [Pbd010315PUBLverdade]; [Pbd010316PUBLjae] Thus, neither the new bridge was built, nor the ancient bridge repair was resumed.

### Boomerang Management

This was a constructed category. It emerged from a set of properties grounded in important organizational features that emerged from the source documents of the Entre os Rios case. The first property, "*Development of backfire strategies*", embraces several supposedly adequate strategies that turned out to produce results that can be considered exactly the opposite of prior intentions. A particularly important example comes from the fact that IEP needed to increase the number of technical people inherited from JAE. This institution was already suffering from severe lack of resources before its extinction. There are also references to the fact that, by that time, technical people would keep mainly desk functions because there was not enough money to cover travel expenses. [Pbd010314PUBLiep] Therefore, to retain JAE's best engineers, while also attracting younger ones, the Institute through its new organizational entity, was now able to offer higher-level salaries than the usual in public administration. However, those applying to the positions would lose the total amount of their retirement funds (Caixa Nacional de Aposentações). The outcome of this measure was that the older engineers opted for retirement, while the younger ones chose to work for private firms. [Pbd010306PUBLinvasão] Although "Drain of expertise" and "Drain of experience" were tightly related here, they are considered as independent dimensions, in the sense that they can occur individually in other settings. Another dimension, also contributing to the same property, is "Legal framing of illegal practices", emerged from the Douro River domain. The notion that sand banks pertaining to public domain were being explored on a totally clandestine manner, contributed to the idea of creating a body that would regulate the activity of sand extraction. After the disaster, Government released public statements about the legitimacy of sand extraction, pointing to an attested routine of daily controlling and reporting. [Pbd010313PUBLgovernoneg] However, articles indicated that new licensing procedures just turned what was a prior illegal activity into a legalized one. [Pbd010315PUBLestado]; [Pbd010308PUBLdeposito] The evidence that the licenses income granted IND a legal profit from its controlling activity and therefore resulted into a twofold benefit both to the extractors and the State is the reverse outcome, deserving mention here.

[Pbd010313PUBLnegócio] This obviously facilitated, rather than reduced, the activity allegedly under restriction.

*“Imposition of artificial fixes”* is a property resulting from two dimensions. The first one labelled *“Implant of power-staff into technical core”* is grounded into the reported evidence that, with the leave of even more technical staff upon the transition from JAE to the IEP institutes, positions had to be urgently filled with new people. However, these newcomers were not selected because of their particular technical expertise, but because they were affiliated to the government political party. Besides, they could also benefit from the installation regimen and thus directly occupy head positions. [Pbd010306PUBLinvasão] Next dimension, *“Outsourced core-knowledge dependencies”* is grounded in analogous evidence and reporting to different periods in time. First, there is an attempted intention of JAE to overcome the notorious lack of human resources and yet answer to the recommendations issued to its services. Although designed and organized by this institution, the national identification and supervision plan previously cited, would entirely rely on private firms applying to the international tender. [Pbd010315PUBLgestão] Second, an external contracted firm undertook at least two of the four registered inspections to the conservation condition of Hintze Ribeiro Bridge. The inspections produced technical recommendations reports that were mentioned as well. It was during one of these supervisions that the underwater video, later shown on TV, was filmed. [Pbd010315PUBLverdade]; [Pbd010316PUBLjae].

*“Acceptance of facilitating practices”* is another property, which together with the previous one tries to convey the idea that the same management style not only imposes top level fixes but also enables the coexistence of another kind of solutions at front level operations. The first dimension is the *“Embedding of «practical drifts»”*. This imported concept advantageously applies to the data analysed, when we realize that bridge controls directly performed by people from JAE or IEP, were essentially relying on evaluations over the waterline. Present practice of IEP's control over roads, bridges and similar structures, was an evaluation relying on their appearance. IEP's President plainly acknowledges the fact, considering that other kind of technical procedures were not possible due to the lack of technical and financial resources. [Pbd010308PUBLnenhuma] IND also controls sand extraction at a distance, producing estimations based on the boats' loading capacity. [Pbd010313PUBLnegócio] *“Pervasive rule enactment”* is another dimension intending to depict the biased interpretation of rules on the field of operation. In the Douro River domain, although 1994's law imposed studies of environmental impact for extractions over one hundred and fifty thousand cubic meters a year, DRAN acts

as if the calculations apply only to each extraction and not to the whole. Therefore, no such requirements for preliminary studies were registered in spite that the notified amount of extracted sand in 2000, was about three hundred two thousand cubic meters [Ex010317EXPareias]

“*Enabling non-sensemaking*” is a property that uses the root of another well-known scientific concept, “sensemaking”. The dimension named “Loss of institutional «durée»” does not come out of any specific article. It emerged instead from the inference of how difficult, if not impossible, would have been for people working in IEP, to keep a sense of organizational identity when their previous institution was extinct and its mission was split and distributed among three new institutes. Even before, by the times of JAE, a former Head of the Divisão de Conservação de Pontes, refers how people envisaged the generalized departure of colleagues, even their Director, how they felt without motivation and how each one was actually doing the least possible. [Pbd010314PUBLiep] Furthermore, those who remained in IEP, against expectations kept seeing key technical functions attributed to outsourced personnel, and vacant internal places filled by many non-specialists. The “Limited knowledge availability” dimension comes as a natural result of the previous one, and is believed to apply to new staff as well. In what refers to the Douro River domain, the creation of IND as a new organization, and the changes of administration it went through in its former times, may let us suppose that both dimensions could have had some significance as well. However, this was not grounded in our articles. Further exploring of these two dimensions will be carried out on the Discussion of findings.

#### Organizational disaster synergy

The first property, “*Error prone organizations’ conjunction*”, materializes on three dimensions. The first one “Agents’ interplaying unawareness” was inferred from the almost complete absence of any kind of inter-organizational planning or discussion, at least one that liaised all controlling agencies intervening on a same setting. Therefore, the only fact that we can call upon here, is the absence of journal articles where concern about each of the organizations’ activities being eventually interrelated was expressed. “Disjointed responsibilities’ perception” is also related to the clarity of responsibilities’ attribution that was mentioned much earlier in this text. The present dimension is supposed to address the outcome of those ambiguities at the level of those executing. In what refers to the Roads and Bridges’ domain, mentions were made to the doubts that were raised about competencies. Thus, a written statement had been produced by IEP in order to clarify that ICOR was the entity responsible for bridges. [Pbd010315PUBLmais] However, the technician sent

to execute the last inspection of the bridge was from ICERR. [Pbd010307PUBLconservaç] Similar situation can be found in the Douro River system. After the creation of IND, this body had its legal attributions focused on the assessment of all activities that could interfere with the navigability of the river. The margins of the river would be kept under the supervision of the Ministry of Ambiente, therefore including the licensing of sand extractions, through DRAN. However, IND took over the licensing role, in spite of the absence of any norm on this. [Ex010317EXPareias]

*"Nature/Organizations' interplay"* is a second property that acknowledges the specific conditions acting on this particular case. Both dimensions "Accident probability increase" and "Accident potential dimension increase" are grounded in several reported examples, happened from 2000 onwards, that associated natural and human causes of disaster, and by this were considered similar to the one happened at Entre os Rios. [Pbd010307PUBLinverno] Acknowledging that it was not just a drama caused by natural elements, but one with dimensions associated with human error, caused a state of anger in the families of the victims. [Pbd010308PUBLficar]

#### *A grounded model for the Entre os Rios disaster*

The concepts that emerged from data analysis were arranged according to the role and sequence they are supposed to have played in the substantive case.

Causal conditions group together those concepts that were judged to constitute the base-line, the initial conditions of this case. Mechanisms and strategies refer to the processes that were used. The internal context intends to group together enabling conditions, those within which the event occurred. Intervening conditions are those that interfere in the time sequence between the cause and the outcome. Phenomenon aims to join together the main conceptual conditions of the substantive case. Consequences include the results, (i.e.) the outcomes.

From such conceptual organization, a grounded model for this disaster could be drawn (Table 2). We followed in this the steps of previous researchers (Correia, 1996; Cunha, 1999) who chose to represent their findings this way, as a "paradigm model of the grounded theory method of analysis" (Correia, 1996, p 70)

*Core concepts and the Entre os Rios disaster*

The notion of “core” or “central” category, concept or variable, in spite of being referred by almost all grounded theorists or researchers who used the method, also has been subject to different interpretations.

For instance, while most – following the steps of grounded theory creators - refer to a single, unique entity (Goulding, 2002), others accept that there can be more than one core concept. Locke (2001), for instance, recommends a maximum of 2.

Dey accurately points to what we also see as the main problem beneath this issue, when he asserts: “By focusing on a single core variable, the research agenda may become one dimensional rather than multi-dimensional. (...) perhaps it can no longer deliver “the fullest possible diversity” of categories and their properties.” (Dey, 1999, p.43)

In any case the concept of core category presumes to represent “the main theme of the research” (Strauss et al., 1998, p.146) and because it is acknowledged to be difficult for the researcher to decide, both Strauss (Strauss et al., 1998, p.147) and Glaser (cited by Goulding, 2002, p. 89) offer similar criteria to help in this purpose.

It is under the light of so many conflicting thoughts and interpretations that we elected 2 core categories, as emerged from our analysis: “front and back span” and “boomerang management”: both are considered as central to the storyline and accounting for a large amount of its behaviour, both are based on recurrent data and closely interlinked to many other concepts. Finally, we also believe that their chosen designation can be applied into other substantive areas, and thus hopefully lead to formal theory.

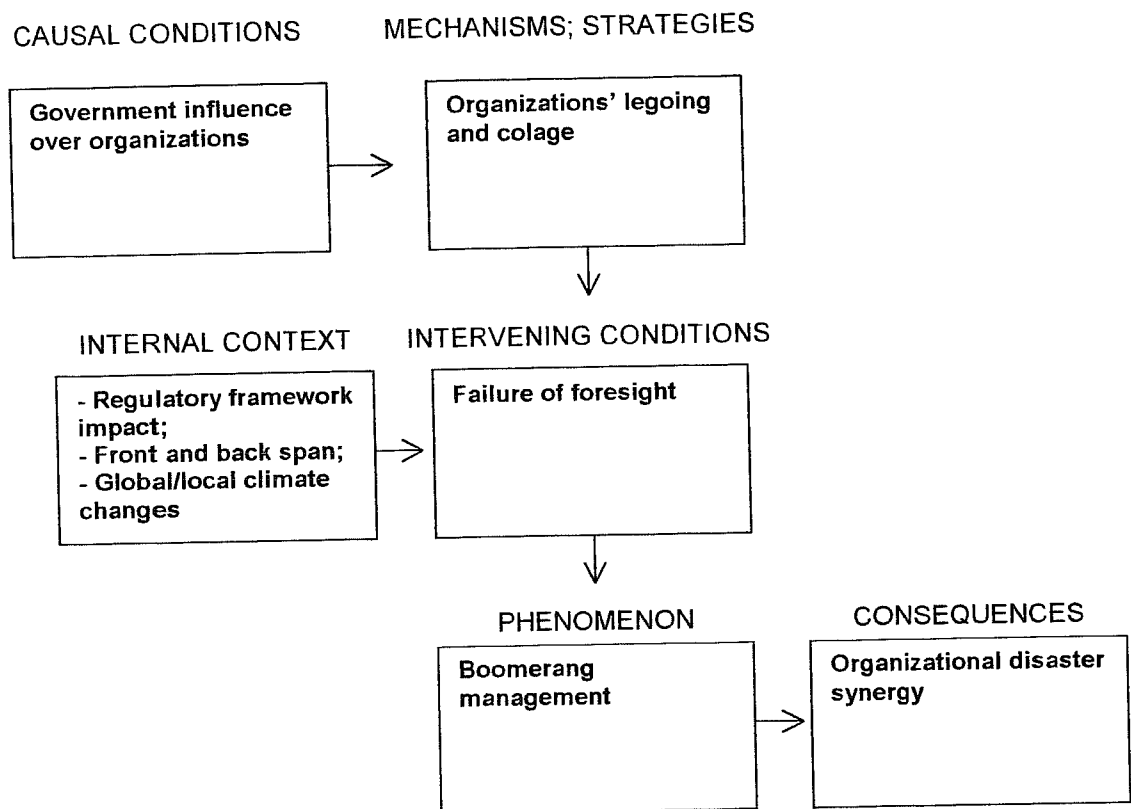


Table 2 – A proposed grounded model for the Entre os Rios disaster

## DISCUSSION

### *Foreword*

The present section requires some preliminary considerations that will be presented through an increasingly focused approach.

### *A wider perspective on research*

Organizations have been studied through great conceptual diversity (Baum, & Rowley, 2002; Clegg et al., 1999; Cunha, Rego, Cunha, & Cardoso, 2003). The wise understanding shown by Thompson in his seminal 1967's book and somehow reflected in his words "It appears that each approach leads to some truth but neither alone affords an adequate understanding..." (Thompson, 1967, p.8) reinforced our own personal belief. We wish to rely on all scientific knowledge gathered in support to this study, without concern for conceptual borders eventually established among some of them.

We are fully aware that considering theoretical perspectives, known as divergent and even sometimes incompatible, may not be peaceful. However, in our opinion, their affiliation to different streams of thought does not make them impervious, and therefore should not inhibit their concurrent application whenever considered useful for the purposes of better understanding.

We also believe this can be a way of answering to the challenge of "multiplicar os ângulos de observação (...) de forma a suscitar tentativas de explicação diversas a partir de pontos de partida distintos" (Cunha et al., 2003, p.12).

Since a researcher always makes choices, literature selection will by itself inevitably influence the way issues will be seen or not seen ("A way of seeing is a way of not seeing" G. Poggi cited by Weick, 2001, p.57). Therefore, it is our option to further assist readers in the comprehension of all lenses that were used during this study.

For this purpose, Table 3 identifies the main readings that were made in the area of accidents and error. Although all those cited in the text will have their corresponding bibliographic citations included among the references at the end, this listing will visually bring together documents otherwise spread among many others.

Date	Author - title	Main purposes of the work (as expressed)	Failure Error	Accident, Disast.	Subj. focus on book		Author' educational backgrounds				Acad. / Pract.	
					Main	Access <sup>ry</sup>	Engin.	Sociol.	Psychol.	other		
1978, 1997	Turner - Man-made disasters	Understanding disaster as socio-technical problems Extend to less destructive areas (ex. Organiz. Planning)		X	X		X				A (UK)	
1990	Reason - Human Error	Get at some of the more general principles of error production	X	X	X		X*				A (UK)*	
1991	Senders et al., eds - Human Error: cause, prediction ...	To understand something about why it occurs and what can and cannot be done about it	X		X			X + Multidisciplinary team of contributors			A (≠ natl <sup>s</sup> )	
1996, 3 <sup>rd</sup> ed	Peterson - Human error reduction and safety manag <sup>l</sup> .	... not only on accident prevention but also referring to error reduction and extended about safety.		X	X			X				
1993	Sagan - The limits of safety: organizations, accidents and nuclear weapons	Improve our broad understanding of how complex organizations manage and mismanage hazardous technologies	X	X	X						Political Science	
1997 2 <sup>nd</sup> ed	Toft et al. - Learning from disasters: a management ...	How organizations can learn from disasters. Provides a risk management framework.		X	X			X			A & P (UK)	
1999	Anheier, ed - When things go wrong: organiz. failures and breakdowns	A collection of essays that explores the broader organizational, political, cognitive and structural aspects of failures (not just organizational)	X		X			X +	Multidisciplinary team of contributors			A (USA)
1999	Goodman - Organizational Linkages	Presentation of the concept of Organizational Linkages as a tool for studying different areas among which accidents...	X		X				X			A (USA)
1984, 1999	Perron - Normal Accidents: living with high risk technol <sup>s</sup>	2 dimensions of risk: complex interactions and tight coupling are the framework for an analysis of inevitable accidents...		X	X				X			A (USA)
1997 2000	Reason - Managing the risk of organizational accidents	Tries to identify general principles and tools that are applicable to all organizations facing any kind of dangers... Improving...		X	X					idem *		idem *
2001	Chiles - Inviting disaster: lessons from the edge of technology.	Description of some well-known accidents/disasters, links between present and past tragedies, analysis of numerous near misses.		X	X						X	
2001	Weick - Making sense of the organization	Illustrates "sensemaking" with a few cases, some of which became "classics" on the topic of accidents/disasters.		X	X					X		A (USA)
2001	Weick et al - Managing the unexpected...	HROs as templates for all organizations that want to be more reliable and manage the unexpected.	X	X	X					X		A (USA)
2002	Dekker - The field guide to human error investigations	Suggests methods and pointers that are well-grounded in the theoretical understanding of human performance in complex contexts, helping investigators produce credible, well documented findings.	X	X	X						X	A (USA) (SWD)

Table 3

Books from the field of disaster with a brief description of their authors' backgrounds and purposes.

Another issue approached here, as a research-wide topic, is the time-frame question. As Giddens marvellously expresses, time is both a most enigmatic and also a most banal and evident feature of human day-to-day life (Giddens, 1984, p.34-35).

As such, the issue of time becomes particularly relevant in the context of social sciences' research.

Avital (2000) recommends looking both for longitudinal depth, as provided by multiple snapshots, and for historicity, as provided by diachronically situating events. We tried to undertake both perspectives, viewing them as complementary, and as contributing to a better understanding of the phenomena under study. For this purpose, chronological frame tables were organized during data analysis (and are presented as appendixes), while we will also approach specific episodes in some depth.

Previous statements attempted to evidence some of the assumptions already made, as well as of those still to be presented during this study (De Búrca, & McLoughlin, 1996). By this means, we try to contribute to the best possible understanding of our work.

#### *A closer perspective to this research area*

A first issue to address concerns the area itself. We started with the intention of analysing a disaster but, when undertaking our literature review, were led to fields connected with human error, failure, accidents, near misses and close calls, just to mention those most often referred. However, we have been mentioning either word without defining their meaning.

We were surprised finding out what a difficult task this came to be.

Turner, (1978, p.14) acknowledges that "Indeed when we consider the manner in which we use the term 'disaster' alongside the almost ubiquitous nature of slips, errors and accidents of various kinds, we may feel, perhaps, that no adequate listing or classification of disasters will ever be constructed".

General textbooks where indexing tables are the usual aid for this purpose, either avoided the terms or used them while applied to some specific case. Specialized books entirely dedicated to the subject did not tend to define what they were dissecting until exhaustion. It was sometimes through other non-directly related manuals that less ambitious and yet more helpful explanations were provided. In spite of this difficulty, a few notes on these notions follow.

Failure: According to Anheier (1999) research on failure tends to shift from a focus on management to analysing this entity in broader contexts and different

settings. Interestingly, the author calls attention to the fact that “not all failures leave us with a clear understanding of who the losers and the winners are” (Anheier, 1999, p.290). One of the general ideas conveyed is that failure is contingent, either as an occurrence or as an outcome.

**Error:** According to Reason (1990) error means different things to different people. Senders and Moray edited the results of a multidisciplinary workshop on the theme (Senders, & Moray 1991). In spite of trying to reach a consensus definition, the whole debate reaches the agreement of how error depends from the perspective, (i.e.) whether focusing on the action or the agent. The final outcome was the organization of a “taxonomy of taxonomies” where main approaches to error were identified and organized according to their applied purposes. Goodman (2000), while dealing with error as a lateral theme in his book, plainly provided the following definition: “Organizational errors refer to the failure of the organization to correct deviations from expectations, which, in turn, results in actual or potential negative consequences to the organization” (Goodman, 2000, p.55).

**Accidents:** In their extensive study of error, Senders et al. (1991) alert to the recurrent confusion between error and accidents. Considering the latter as totally out of their scope of analysis, the authors underlined a distinction. They emphasized that accidents often happen when no error is made, although they can also come as the consequence of an error. Perrow (1999) provides what he calls a formal definition, distinguishing accident from incident under a very clear systems’ perspective: “An accident is a failure in a subsystem or the system as a whole, that damages more than one unit and in doing so disrupts the ongoing or future output of the system.” (Perrow, 1999, p.66) The damage being limited to parts or a unit was considered to constitute the distinctive characteristic for incidents. Turner, still illustrating how elusive the concept is, refers to many authors choosing to elaborate disasters’ lists as a way to limiting the question, while others attempt elaborating on classification schemes (Turner, 1978, p.9).

**Disaster:** Once more, we call on Turner when he mentions that disaster studies’ merge with accidents, though a disaster is considered to present worst consequences. From this idea, he concludes that most distinctions were established while focusing on the post-disaster phase, not on the specific characteristics of the phenomenon (Turner, 1978, p.9). Therefore he offers his own definition: “...disaster, may be considered as an event concentrated in time and space, which threatens a society or a relatively self-sufficient subdivision of a society with major unwanted consequences as a result of the collapse of precautions which had hitherto been culturally accepted as adequate” (Turner, 1978, pp.83-84).

As no particular distinction was noticed in the literature between accidents and disasters, both vocabularies will be used indifferently in our text.

A second issue refers to the pluralism of this field of research and by this, we are considering error, failure and accidents altogether.

Senders et al. (1991) brought together international experts from many different scientific disciplines for a workshop on human error. Anheier (1999), as scientific editor of twenty four authors from various backgrounds, organizes his book as a comparison on organizational, political, cognitive and structural perspectives on failure. Reason (1997) tries achieving an enhanced analysis using the person, engineering and organizational models of human error. Diane Vaughan in her foreword to the second edition of Turner's book (Turner, & Pidgeon, 1997) believes that the multidisciplinary trajectory of Barry Turner greatly contributed to his pioneering and leading scientific perspective on the study of disasters.

Another illustration of this point, although at another level, was the fact that different journalists, while covering the news in many of our documentary sources for the Entre os Rios disaster analysis, collected testimonies from a wide range of specialists, from structures' engineers to river hydrodynamics' specialists.

Because this study area has been the focus of such multidisciplinary interest, the background of each of the authors referred in Table 3 (p. 43) was also registered, whenever available. This may contribute towards a better interpretation of their views. Both academics and practitioners studied the field, and the many works already published display the difference of perspectives this usually implies.

A third issue to address here, is the distinction between research studies such as the present one, and other kind of investigations – such as legal or criminal inquires - even when focusing the same subject.

The latter are always oriented towards the identification of very specific causes, judged to have produced or contributed to produce the accidents. Above all, they look for people (usually front-line persons) behind those causes. The aim of these kinds of investigations is directly related to the attribution of guilt penalties and/or indemnities.

On the contrary, research studies in this field, aim to grasp all possible structures and processes involved in the situation under study, with the purpose of understanding the whys. One can truly say that often, if not always, such empirical approaches develop insights that could even seem as running against investigation reports, in that they tend to bring forth contextual comprehensiveness instead of excommunication judgements.

Furthermore, the overall tendency to approach error and accidents looking for specific persons (usually operators) whom to blame, is a wide issue of concern and deeply lamented by the majority of authors. The role of biased or faulty reports is also stressed (Perrow, 1999; Reason 1990; Sagan, 1993; Vaughan, 2003; Senders et al., 1991) and tends to aggravate this problem.

As a specific illustration of such bias to blame, as applied to the Entre os Rios disaster, we will take on the words of the officer-in-charge of the rescuing and salvage operations in the aftermath of the disaster, while referring to ways by which media were approaching the news:

Durante a exibição da gravação e no debate posterior pareceu-me que se queria encontrar ali os culpados e julgar instituições e pessoas, na praça pública, mesmo antes da recolha de dados que levariam a compreender melhor as causas do acidente. (Ezequiel et al., 2001, p. 88-89)

#### *Approaching the actual research study*

We wish to address here four topics that emerged as we were developing our study. This is the reason why we chose to put them at the forefront of discussion.

How to define the diverse organizations under study, appeared as a first issue of concern. At this point, we chose to rely on the Blackwell Companion to Organizations' statements that "the diversity and complexity of organizations and their activities is difficult to capture in a single formal definition" (Baum et al., 2002, p.2) as well as "the range of imaginative rational, natural and open system ideas from which contemporary perspectives on organizations emerged ..." (Baum et al., 2002, p.9).

A second issue came to be about organizational level. Our story and corresponding emergent data, were constantly going back and forth between individual and groups, departments and units, institutes either affiliated or independent, macro-political institutions as ministries and even geographic communities. Again, we found stimulating thoughts on the Blackwell Companion to Organizations when it acknowledges that "...the particular distinctions among organizational levels are a matter of analytical convenience..." and that a "a multilevel approach is thus useful because organizational systems are hierarchically arranged" (Baum et al., 2002, p. 7). Using a straightforward distinction as the one adopted throughout the same textbook, seemed useful enough for our purposes:

intraorganizational, organizational and interorganizational levels. In this text we will be relentlessly coming and going from one to the other. We would like to call again on Barry Turner, who acknowledged his emergent theory on disasters to include “psychological, organizational and inter-organizational elements” (Turner, 1983, p. 342). Perrow (1999) also considers that any thick description of hazards will have to include subjective and cultural dimensions.

During the analysis, and almost from its start, a third question emerged closely related to the levels’ topic. It became clear that two different systems, to adopt here a Perrow-like designation <sup>2</sup>, were involved in this case: the Douro River system and the national Roads and Bridges system. However, we chose to use more often a “domain” designation, hereby considering domain as the claims an organization makes for itself in terms of range of products or technology included, population served and services rendered (Thompson, 1967, p. 26, citing and adapting Levine and White). In spite of the fact that organizations in this case demonstrated a blurred perception of their domains and effectively had fuzzy responsibilities attributions, the domain designation was nevertheless considered to be an adequate terminological choice.

A fourth issue is again the time-issue, hereby presented as a specific concern within our own field of study. In the context of accidents, this topic is associated with establishing a well-defined starting point (most times from which to define whom to blame). Reason also uses the time-frame to distinguish between “bottom-up in causation” and “top-down in investigation” where causal research always starts in organizational factors (Reason, 1997, p.16).

Researchers in this area, as well as approaching the disaster onset (Turner, 1978) with different purposes, also draw on different questions about time.

One, is recognizing that no matter how accurate the research process aims to be, researchers, always benefit from “the luxury of hindsight” by working in the aftermath of disasters (Vaughan, 1996). Almost every author in this field underlines the huge difference between what is now seen as a well defined and structured problem, and the situation as it appeared and developed to all those involved at the time of the occurrence (Deckker, 2002; Perrow, 1999; Turner,1978). Almost total immersion into the research field took Vaughan many years, being now viewed as one of the rare occasions (Pidgeon, 1997) where this kind of research trap could be minimized.

<sup>2</sup> A system depends on what we want to call as such. Systems’ functioning can be affected by damage to people or objects but also to symbols, communication patterns, legitimacy or a number of other factors. (Perrow, 1999, p. 64).

Another time-related issue in accidents' research context, is about the limiting dates for research. Reason (1997), shows what we think to be a wise and sensible view on this. Considering there cannot be clear-cut rules about this matter, he believes that either the specificities of the story or the resources available will help showing the way.

As to our own research, the academic deadlines and the early-established documentary sources' limits seemed at first the only necessary time definitions for us. Very soon we realized it was not so. How far back would we consider the story to go? Reversely, would we include in the same research data referring to some post-disaster situations? Our options were: first, making retrospect as far as data were referred into our newspaper articles, and second, including some additional post-disaster episodes associated to the main accident story, whenever the coding process identified them as reinforcing or reiterated situations in relation to the pre-disaster conditions. They will be eventually mentioned as such.

#### *Main constructs from literature review*

Some constructs used in the previous section were selected from the many thoughts and concepts brought to this study by literature review.

We came to think that they show different characteristics among each other. While some of them, either by encompassing other constructs (e.g Failure of foresight), or by naming a theory after them (e.g Normal Accidents) can be considered as a sort of meta-constructs, others cannot, being more specific ones (e.g. decoy events).

In spite of this, it is time to attribute paternity to each of them. Dates are not referred because we do not know the first time they were applied (i.e.) used.

Besides mentioning all those concepts used in our text, Table 4 also registers some other non-cited, but nevertheless considered relevant, constructs within the field of accidents, once they would not have figured otherwise in this work.

A particularly sounding notion that was also imported from external sources into our text, and therefore also deserves mention, was "stuttering", a vocabulary used by Brown and Eisenhardt as meaning "start, stop, restart" (Brown, & Eisenhardt, 1997, p. 20).

Another quoted concept that was used in one of our dimensions was "durée" used by Giddens (1984) to express a continuous flow of conduct, the flow of daily social activity. Particularly relevant for us was his notion "of the intersection between the life process or "cycle" of the individual, the *durée* of activity on the one hand and the *longue durée* of institutions on the other" (Giddens, 1984, p. 61)

Construct	Author
Active failures & latent conditions	Reason, J.
Decoy events	Turner, B.
Eco-system accident	Turner, B.
Failure of foresight	Turner, B.
Interactive complexity & tightly coupling	Perrow, C.
Man-made disasters	Turner, B.
Normal accidents	Perrow, C.
Normalization of deviance	Vaughan, D.
Power distance	Hofstede, G.
Practical drifts	Snook, S. <i>cited by Perrow</i>
Variable disjunction of information	Turner, B.

Table 4 – List of some constructs in the field of disaster and their affiliations

#### *Discussion and literature review*

Organizations under study are complex, such as were data emerged from our analysis. Insights provided by different authors added new and richer dimensions to them. Considering that each of the most cited disasters in literature have been approached through great diversity of perspectives (like Challenger's being used to illustrate power, culture, controlling bodies' and many other paradigms), we realize that the task is not an easy one. The matrix of common attributes for 4 severe accidents (Peterson, 1996, p.70) provides a clear illustration of this point.

Looking for adequate understanding, we became aware of constantly mixing times, organizations, domains, levels, lenses. However, this finally was considered an appropriate way of approaching and describing non-linear, interlinked and complex phenomena, such as the one under study.

During this journey we hope to have kept the balance between objectivity and sensitivity as recommended by Strauss et al. (1998, p.42)

Some of the findings that emerged from our analysis made surprising fit with empirical results that had been both directly or indirectly accessed. Others did not, thus producing some thoughts also to bring into discussion.

We will follow two approaches here. A first one will follow the steps provided by our conceptual organization (i.e.) under different conditions. It will mostly link findings to our literature review. A second approach, while obviously relying on the

previous one, will try to further extend those thoughts and thereby draw on our overall understanding of the case.

In this endeavour, we are well aware that a major difficulty will be finding the right level between what constitutes the individual and specific cause-effect pattern and those generalizations that only produce obvious conclusions (Reason, 1997).

### *First approach to the discussion*

#### Causal conditions

In spite of a first tendency to see these conditions as being considerably far away from any specific accidents' occurrence, we cannot forget the role played by initial conditions in the development and outcomes of complex phenomena as defended by complexity theories. We will thus acknowledge that small events can have large effects, involving so many variables and with such sensitivity, that our current, still fragmented research cannot accurately predict outcomes. This applies to Lorenzo's well-known butterfly meteorological example as it applies to Beta's perfect market strategy failing before VHS' (cited by J.M.Fonseca, lectures on "Advanced topics in Management", ISPA, 2001).

Even by using a more classical approach we also learn about the amplifying power of any organizational hierarchy (Turner, 1978). This means that errors produced at a higher level will cause more complex forms of unwanted consequences.

Focusing on the property and dimensions related to high level organizational reengineering and change, we cannot avoid using Sagan's (1993) mention to Perrow, referring to the political side of his theory: he stressed conflicting interests existing not only inside organizations but also among organizations and the political community, and considered this to influence accident occurrences, blame attribution and correcting prospects (Sagan, 1993, p. 32).

At this point, the notion of responsibility also becomes particularly important being closely related to blame attribution. These topics were heavily discussed by most of our writers (Perrow, 1999; Reason, 1990; Sagan, 1993; Senders et al., 1991; Vaughan, 2003).

While mentioning the usual tendency to turn responsibility's attribution to the operator, Sagan also underlines that accepting "the result of mistaken design or faulty decisions by senior management", seldom happens (Sagan, 1993, p. 208).

If we connect this idea, to the one about high level hierarchies' scope of influence on results, those subjects evidenced in the source-articles behind these dimensions, make more sense. However, Pidgeon (1997) also acknowledges that in

complex systems, responsabilization can be just as dispersed and fragmented for failure as for success.

A further look and related comments:

Discretionary power at top level of hierarchy has a wider impact and influence in subsequent organizational processes.

Occurring first in the time sequence (which represents also a conditioning advantage) it is also reinforced by unchaining a cascade of processes.

Some of them can be reduced in their unwanted effects, both by undertaking less vast and frequent changes, and by enhancing issues of responsibility and accountability. None of these occurred in this case.

#### Mechanisms, strategies

Concepts hereby included, all seem to be somehow related to the issue of boundaries.

Starting with a less organizational viewpoint, we acknowledge with Giddens (1984) that boundaries help in the control of anxiety by differentiating participants from non-participants, and also agree with him that boundaries can be either physical or symbolic.

Although perceiving them as ever changing and inherent to everyday life, most writers recognize that their definition becomes important for practical reasons. It looks obvious that organizations require a level of accuracy that is not practicable in individuals.

Although being arbitrary, and thus depending on the perspective being adopted, boundaries can be drawn for different purposes on the basis of technology, product, process or country of the focal organization (De Burca et al., 1996, p. 6). In the Blackwell Companion to Organizations (Baum, 2002) most boundary references are made as related to market identities.

Goodman (2000), for instance, perceives boundaries as linked to defining organizational space and relevant actors. While also acknowledging them as not fixed, ever changing, flexible and permeable, he mainly stresses their role in providing direction (Goodman, 2000, p. 44). Richardson and Lissak plainly state that, once we accept organizations, we define boundaries for their practical administration and as management tools (Richardson, & Lissak, 2001).

Turner (1978) mentions boundaries as interfaces between systems or in complex systems and achieves a perfect articulation of both symbolic and physical dimensions while stating that "a 'site' represents the concrete aggregation of whatever abstract systems have been imposed upon it, together with an amount of ancillary and fortuitous material (and people)" (Turner, 1978, p. 73).

Baum and Rowley offer a broad overview of the perspectives on this issue, and mention three possible ways to determine boundaries while affirming that

not surprisingly relational, activity-based and normative boundaries do not coincide, and so organizational boundaries will typically be somewhat blurred. Thus, notwithstanding the efforts of groups and organizations to differentiate members from non-members, it will often be the case that formal group and organizational boundaries fail to delineate all key activities and relations. (Baum et al., 2002, p. 8)

However, Thompson (when referring to coalitions), alerts to the fact that, in complex organizations, conflict potential increases when there are interdependencies among "members and areas they represent and as external forces require internal compromise on outcome preference". (Thompson, 1967, p.143)

A further look and related comments:

Drawing on organizational boundaries thus seems to be together an impossible and a necessary task.

Impossible, because it requires drawing on multi-level approaches, each of them subject to interpretations (whichever the degree of guidance and control being offered).

Necessary, because fuzzy area definitions and blurred boundaries contribute to anxiety generating and either provoke conflict over interdependencies, or create "nobody's' areas", (i.e.) domains without any form of relational, activity, or normative appropriation.

We believe this last description emerged in the analysis of the Entre os Rios disaster.

#### Internal context

Internal context concepts that were identified, refer to an array of conditions that we suppose to be part of a global situation that still prevails. They also can be viewed as latent conditions, (i.e.) conditions waiting for any precipitating factors to mingle with, in the production of unexpected and unwanted events (Reason, 1997).

It is not by chance that this same author also considers latent conditions to come from top (Reason, 1997).

Most of the concepts included here are not new, either to common sense knowledge, as the drawbacks from climate change, or to common sense plus empirical findings, as the regulation topics.

What has been named here Controlling/Controlled interplay can, from our viewpoint, be envisaged at two different levels. The first one acknowledges this reciprocal relation as a natural one, a sort of agreed platform by which two independent entities manage to accept and perform their mutual roles. Although approached with different lenses and by diverse designations, authors like Giddens (1984), Vaughan (1996), Reason (1997), have analysed this very issue. The second level goes farther than this and addresses the less common case where regulator bodies, more than just identity issues, have vested interests to defend (Mahon, 1984; Reason, 1997).

Both levels have been connected to the occurrence of disasters and both levels were identified in the Entre os Rios disaster. It was amazing to notice how many features of the source articles within this category perfectly match many examples of accidents advanced by Reason (1997) in his chapter about Regulators' agencies.

The concept of front and back span, defended here as a category, is regarded as a very important one, and relies on two diverse properties.

The first one builds on findings of the Hofstede's international study (Hofstede, 1994) and can be considered as a well known national cultural characteristic. Weick and Suthcliffe refer to disconnected operations, as viewed from top or implemented at front line (Weick & Suthcliffe, 2001b) thereby providing a closer link to our field of study and to our grounded findings. Among other features, Bahrings Bank collapse was also connected to the existing physical distance both from London's Bank headquarters to Singapore, and between the floor where disastrous financial operations were taking place, and the head office floor (Goodman, 2000; Reason, 1997).

However, we also identified another property, this time eluding more easy and straightforward approaches. We believe it to represent a particular context of some regions in Portugal, therefore incorporating potential conditions for other forms of disaster. This concept and its dimension revealed characteristics that partially connected to findings of scientific literature on the area, but nevertheless defied total fit.

Notions that we considered as similar to this one in the context of organizations, had some sort of difference among each other. Such are the notions of "organizational exclusivity" (Turner, 1978) as a disregard of non-members, which also seems related to Weick's et al. (2001b) alert against organizational "insiders" creating redundancy thoughts, which in turn can be articulated with the "groupthink" behaviour in decision taking (Irving Janis cited by Pidgeon, 1997). In spite of this latter model being originally conceived from "small, highly cohesive and isolated

policy making groups” (Pidgeon, 1997, p.177); (Brown et al. 1997), its basic idea was later extended to less restricted organizational contexts and thus deserves further examination.

Giddens (1984) provided what we believe to be simultaneously the more accurate and wider conceptual framework for our understanding of these data. His theoretical conceptualization of regionalization embraces more than mere space location and refers to a zoning of time-space. His centre-periphery description gives precise support to the distinction between the established and the outsiders, and thus justifies the establishments that are linked to dominant classes (Giddens, 1984).

A further look and related comments:

The theme of Controlling Bodies and their related paraphernalia represents one of the main paradoxes found within the hazards and safety area.

They are indispensable as means of controlling activity performance, in accordance to established designs or processes. They also are dangerous contributions to hazards, in the sense that, either they compromise in order to carry on their own role, either they reinforce any existent vested interests, mixing interests of those being controlled with their own.

In this way, regulator bodies can be viewed as any other kind of defence or safety device, (i.e.) with the same conflicting roles authors' attribute to the latter: potentially contributing to prevent accidents and potentially contributing to their occurrence as well.

In the Entre-os-Rios disaster, major organizations from both domains had controlling attributions. It is significant that, although at different times of their organizational life, both were sometime accused with performing with vested interests. In spite of being considered as one of the regular features within the field of disasters, this requires proper mention here as well.

In this internal context, a second focus of analysis may, at first glance, look a most familiar one. It refers to issues of hierarchical top-bottom distance, power positions, member inclusion and exclusion, all recurrent subjects within organizational studies.

What we believe to constitute a new fact emerged from this analysis, is the role of political parties in the contribution to the disaster. We think that a political party (any and whatever their political cycle) in hold of power (i.e.) occupying a central position, may also be subject to “groupthink” and therefore form of defective reality testing that does not allow any outsiders' perspectives. This form of silencing outsiders' voices was perceived as a relevant factor in this case.

### Intervening conditions

Concepts grouped here, were considered as more specific to the substantive case, although not unique to it. Turner's construct "failure of foresight", a self-explanatory label, was regarded as a meta-construct, in the sense that it covers most of the perception and information problems that have been reported to be involved in the occurrence of disasters. The extent of his research, together with his own analytical capacity, led us to adopt some of his scientifically validated concepts whenever considered relevant to our substantive case, as mentioned before.

The kind of information and communication problems that have been identified here match most, not to say all, studies in this area. Although Turner (1978) has provided great detail in this subject, authors like Sagan (1993), Brown et al. (1997) and Weick et al. (2001b) also underline the importance of the issue. As they add new perspectives we also judge being useful to the discussion, we will revisit them later, namely when discussing organizational learning.

Other concepts that emerged from the present case, have been grouped under this same "umbrella" construct, although not belonging to the dimensions included in Turner's original description. However, as a theoretical recognized construct, this label shows an encompassing quality that, in our opinion, allows the incorporation of other concepts.

The first added concept focuses on management, and although also implying breakdowns, it surprisingly seems to refer to rhythms more than any other quality.

Breakdowns are recurrently cited in the scientific field of disasters. A first logical explanation for this, may be that most major authors writing about accidents use a system's theory approach (Goodman, 2000; Perrow, 1999; Reason, 1997; Turner, 1978). Goodman calls them "missing linkages" where "Organizational linkages refer to the connections between activities, events, and outcomes" (Goodman, 2000, p.30) considering these breakdowns as major features against organizational performance and thus including into his analysis both failure and accidents.

We prefer adopting here another perspective and focus on rhythm instead. Besides being related to organizational improvisation (Cunha, 1999) which is not considered to be the case here, the importance of a cadence in management was found on an article by Brown et al. (1997). The authors were looking for specific features that could differentiate success from failure, in firms operating in high competitive environments. One of those main differentiating characteristics they refer to is the ability to impose a time interval that regulates organizational pace in a proactive way. A stuttering mode of project management was perceived by them instead in less successful firms.

As to the second dimension, we did not find any similar situation in the literature. Although closely related to the first one, we perceive it as distinct.

The label "Illiteracy to hazards" aims at joining different features, each of them referring to one disabling organizational condition in what refers to safety matters.

Decoy problems is another Turner construct and refers to "a number of instances where some hazard or problem was perceived, action taken to deal with that problem distracted attention from the problems which eventually caused trouble" (Turner, 1978, p. 60).

Some cases pointed to decoy events coming from outside the organization, while this was not the case here. The kind of event we considered as decoy was generated inside the organization, which we believe makes it even more difficult to detect.

Warnings and alerts have been often linked to cognitive studies that bring forth concepts like groupthink, "wishful thinking" and other, thus concentrating on groups and individuals. Other kind of empirical studies tend to focus on organizational level instead and tie this issue to an ongoing scrutiny of the environment and attention to surprises, as in High Reliability Organizations (HRO).

HRO develop a "mindfulness" aptitude, a blend of culture and processes, that enhances all organizational capabilities towards managing the unexpected, both by reinforcement of anticipation and by resilience (Weick et al, 2001b). In such almost idealistic HRO settings, some of the least sophisticated prescriptions refer to alertness and learning.

Because most accident and disasters' texts also discuss safety issues, Organizational Learning (OL) has been introduced as a related topic. The main difference noticed among authors in this matter, does not rely chiefly on the level of importance attributed to the concept by itself, but rather on the possibility of its fulfilment.

Some authors, taking into account either the many barriers to learning, either the characteristics of man-machine systems, do not consider this issue to become a realistic solution in the quest for safety (Perrow, 1999; Sagan, 1993).

Others stand for a different point of view and put OL among primary issues, being achieved even from samples of one or fewer (March, Sproull, & Tamuz, 1991). Others still report that organizational failures and near-failures have far reaching beneficial effects on the collectivities to which those organizations belong to (Miner, 1999). This is also where learning from close-calls and near-miss take an important role (Sagan, 1993), and trial-by-error may be impossible...

It is worthwhile noticing here, that snapshots about disasters and near-miss stories, recurrently cross the whole chapter that is dedicated to the topic of learning in Jablin's seminal Handbook on Organizational Communication. Their authors also underline what we understand as a corroboration of our own thoughts, that is, communication and learning being intertwined (Weick, & Asford, 2001a, p.704). As Weick et al. thoroughly analyse possible barriers as impediment to learning, among which the context, we can draw a more clear understanding of the interrelations of most of our concepts within this condition.

Brian Toft (a Barry Turner's disciple) and Simon Reynolds, when studying disasters, use the concept of "failure of hindsight" expressing an organizational failure to learn. They consider this to happen to organizations either from non-absorbing information from earlier disasters or from failing to respond even after being forewarned (Toft et al., 1997, p. 17).

A further look and related comments:

Acknowledging Turner's construct failure of foresight as an intervening condition of the Entre os Rios disaster cannot be considered a novel approach by itself, once notions included in this concept are most probably behind the great majority of disasters.

We think that, besides communication and information problems, and the dimensions belonging to an inability to recognize and interpret (not to mention anticipate) danger, a novelty here may be the discovery of a specific management characteristic that emerged out of this case: a sort of "arrhythmic" management style.

In this sense drifting management hopes to extend and develop on notions already attributed to failure of foresight, and thus embed this other concept into disaster conditions as well.

#### Phenomenon

The construct classified as phenomenon is the heart of our grounded study. We will therefore discuss its specific findings interconnectedly and thoroughly in support of our claim.

Properties here are mostly dealing with managerial characteristics, thus a first comment will address the manager. The issue of organizational leadership was absent from data analysis. There were managers though, and for this mainstream topic of discussion we chose to rely on proposed distinctions offered by an academic organizational textbook (Cunha et al., 2003, p.270, 271-2). However, such differences mostly rely on the identification of individuals' attitudes when dealing with specific managerial issues. With a rather different purpose, Goodman (2000,

p.110-111) lists what he calls “managerial levers” to change. We consider this a possibly more useful approach to the issue as required from the present case, but will not develop on the subject. Acknowledging that issues of power and convenience were behind the choices of individuals to hold managerial positions is thus considered sufficient for the present discussion.

Managers in our case, intended to correct and improve what had been previously diagnosed as erroneous situations: corruption in the domain of Roads and Bridges, lack of control in the River domain, severe lack of human resources again in the Bridges’ domain. Specific strategies to address these problems were designed and implemented. Those strategies developed in reverse outcomes, acting as reinforcements to the problems.

In our literature review, the issue of technological fixes releasing such negative effects in what is called man-machine systems, is more frequent (Perrow, 1999; Reason, 1997) than the occurrence in purely soft, human situations. Goodman (2000) also refers to such positive feed-back loop phenomena in the context of Total Quality Management (TQM) change efforts that resulted on failure.

We will now compare our theoretical readings with emerged findings, seeking better understanding through our authors’ eyes:

Senders et al. (1991) would comment that any re-arranged system becomes a new system, thus requiring a completely new evaluation. Theoretical views cited as opposite to Perrow’s Normal Accidents Theory (NAT), are mainly connected with HRO perspective (Sagan, 1993). According to the ideas of Roberts and Bea (Roberts, & Bea, 2001) the inexistence in our case, either of reliability as constant attention to processes, or of avoidance of competencies becoming incompetencies, would have been a possible comment here. Other recent approaches (Weick et al., 2001b) would probably add recommendations about connecting top decisions to lower level operations, an idea that, in some way, can also be considered within these authors’ label “deference to expertise”, recognizing knowledge wherever it may be located in the organization. The registered absence of such processes would, in the eyes of HRO, probably explain a significant part of this disaster.

In our opinion, all approaches provide useful contributions to the issue under discussion, but neither alone can be endorsed as the more adequate theoretical frame for this.

Taking a rather different theoretical perspective, we could also turn to one of the strings of chaos and complexity theories as applied to organizations, and connect ourselves to an even less control-dependent and thus more querying position. Stacey (2001) would find here grounds to confirm his view that strategic intentions

cannot hold against complex responsive processes in organizations. He would refer to "(...) the paradox of control, the requirement that managers be "in charge" when they cannot be "in control" (Stacey, 2001, p. 233).

The fact that Sagan (1993) and also Perrow (referring to this same author on the second edition of his book, 1999) highlight March, Cohen and Olsen's "garbage-can" approach to decision seems interesting to our analysis. According to this approach, some complex organizations behave like "organized anarchies", operating on inconsistent and ill-defined preferences, where processes are not clear to members and their participation in decision processes is fluid irregular and even uninterested (March, Cohen and Olsen cited by Sagan, 1993, p. 29-31). It must be stressed here, that in spite of this scenario, Weick and Ashford mention current studies on HROs suggesting that garbage cans may be safer than hierarchies (Weick, & Ashford, 2001a).

Weick, Suthcliffe, and Obstfeld consider that "Effective HROs represent complex adaptive systems that combine orderly processes of cognition with variations in routine activities in order to sense and manage complex ill-structured contingencies." (Weick, Suthcliffe, & Obstfeld, 1999, p. 117)

The inclusion of Perrow's system's analysis among complexity studies as it is listed in the Blackwell's Companion to Organizational studies (Baum et al., 2002, p.210-211) becomes understandable in such context, once NAT assumes accidents to be inevitable and even more, normal. More remarkable at this point, are Perrow's words (1977's essay cited by Sagan, 1993) when sustaining that empirical studies would most probably

...reveal what most managers know but social scientists cannot afford to acknowledge, mainly that complex social systems are greatly influenced by sheer chance, accident and luck; that most decisions are very ambiguous, preference orderings are incoherent and unstable, efforts at communication and understanding are often ineffective, subsystems are very loosely connected, and most attempts at social control are clumsy and unpredictable.

Turning now to some specific dimensions found in our grounded analysis.

The fact that licensing could become a legal economic support to the controlling institution is not new in the field of accidents. It was also described within NASA in the Challenger case (Vaughan, 2003), and is among the many multifaceted forms of control by Regulator Bodies that were registered in our readings.

However what we believe to be particular to our specific phenomenon, is the fact that it was more than an unexpected outcome, it was the emergence of precisely the opposite effect, which we have called as “backfire”. This also applies to other dimensions as we will try to develop next.

Empirical work by Perron and Friedlander cited by Perrow (1999, p. 362) had shown how downsizing increases worries, work pressures and overloads, thus affecting interaction and information exchange among employees and thereby resulting in diminished capacity to understand the system they try to control. Although this case does not refer to intentional downsizing, the outcome was the same.

We wish to stress here the twofold effect from drains in this case: first, that core expertise was lost and second, that along with it, organizational stories, memories and non-explicit, informal knowledge were also lost.

We think that intended corrective actions, such as recruiting less specialised personnel and contracting outsourced staff – again by backfire strategy - deeply aggravated the existing situation in two ways.

A first one was by turning the technical core, a component that in Thompson’s eyes (Thompson, 1967) organizations attempt to protect the most, into an Achilles’ tendon instead, (i.e.) the weakest part of the organizational body.

Although Thompson published in 1967, his views seem to apply to what happened in this case, and further underline how dysfunctional this organization (IEP) became. It appears that IEP’s adjustments to contingencies at organizational technical core level, went precisely against Thompson’s views about what the main roles of technical core and of boundary spanning components should be in any organization (Thompson, 1967).

A second aggravated result we wish to address here, is identity loss, something that was already described as a major contributing factor to the Mann Gulch fire disaster (Weick, 2001). Our non-sensemaking is also about failure to connect among each other, as members of the organization, and with the organization as well.

Giddens’ core notion of “structuration” inserts the notion of continuity in the reproduction of social systems (Giddens, 1984). More precisely his concept of “longue durée” of institutional time, as expressed in daily routines of social life (Giddens, 1984, p. 35) is used here to illustrate our point. How could an organization persist other than as an empty institutional label, when most of the people contributing to that sense of durée were gone?

Brown and Eisenhardt report noticing how processes and mechanisms enabled building on the past while looking to the future in successful organizations. Existing interaction among projects and units, also provided people with sense and motivation (Brown et al, 1997). However, in our case both things were described as lost, in some of the source-articles.

We wish to rely here in words by Albert, Ashforth and Dutton (2000, cited by Richardson et al., 2001, p. 48)

Identity and identification are very powerful terms. Because they speak to the very definition of an entity – an organization, a group, a person – (...) As conventional organizational forms are dismantled, so too are many of the institutionalized repositories of organizational history and method, and the institutionalized means by which organizations perpetuate themselves. Increasingly an organization must reside in the heads and hearts of its members.

We would comment that, if this seems to be true for virtual organizations, a reverse situation can be imagined as well. Therefore, the opposite case of a physical non-organization can probably exist, as we believe it was the case here.

Although using diverse lenses, many organizational scientists and accidents' theorists also provide support to our interpretation of the findings from this category.

Weick et al. (2001b) mention sensemaking as a contribute to organizational resilience. We also know that Organizational Learning (OL) can build on errors, near-misses, sometimes even accidents, but it always requires some link connecting past experiences to present situations.

Stacey claims that knowledge is continuously replicated and potentially transformed in the communicative interaction between people (Stacey, 2001, p. 222). Continuity is thus an essential part of this process.

Both dimensions included into the facilitating practices' property, are related to rules. The notion of rule proved to be immensely important in our readings and is equally controversial.

Giddens (1984) offers many important insights in this matter, although we will underline only two of them. First, the idea that many seemingly trivial procedures followed in daily life have a more profound effect upon the generality of social conduct than more abstract rules, such as laws. This also supports our previous topic of discussion about the seriousness of draining experience. Second, the notion

that what we consider as expressed rules (such as written laws or regulations) are just codified interpretations.

Herbert Simon's "administrative man" (Simon, cited by Turner, 1978 p. 165) acknowledges that, even people in passive roles by implementing a procedure, are also contributing to the existing stock of organizational decision-premises. This goes along with Giddens' (1984) view on the agent.

However we will also look for more consensual theories within authors closer to our field of research. At this point, we become confronted with a few divergences.

Turner identifies rule breaking as a potential contribution to disasters. So do Perrow (1999), Sagan (1993) and most of the writers in this field.

However, Sagan (1993) when commenting about systems' increasing opacity, also recognizes that operators can work around, if the devices do not serve their interests. Besides, Reason (1997) acknowledges that some violations can become a routine when resulting from organizational insufficiencies, and whenever offering easier working conditions.

Sagan (1993) also mentions the existence of "loosening criteria". He reports the existence of instructions written in vague terms ("under most conditions"), even in such systems equally potentially catastrophic and controlled as it was the case for US nuclear military power.

Scott Snook (cited by Perrow, 1999), mentions an array of minor deviations without which the organization could not function: useful if taken independently, but dangerous as a whole. "Practical drifts" is the label he gives to this practice of individually inconsequential deviations that resulted in the slow, steady uncoupling of local practice from the written procedures (Snook, cited by Perrow, 1999, p. 377)

It must not be forgotten at this point, that managers also break the rules. Vaughan (2003) lists some of the ways by which they do so.

Taking an opposite perspective, Weick et al. (2001b) consider that resilience also depends on rule enactment. Improvisation, as a generation of innovative and successful organizational solutions, is sometimes a way of by-passing existent rules. He also mentions the usefulness of continuous adjustments (Weick et al., 2001b).

And finally Rerup (2001) while analysing Apollo 13 safe return to Earth (a successful near-miss) considers resilience as a result of NASA's institutionalization of a culture that simultaneously builds on rule following and rule breaking.

These are clearly conflicting perspectives on the issue of rules and their role in accidents.

Our choice to call the kind of bridge inspections performed by IEP as an "embedding of practical drifts" instead of the famous Vaughan's (2003)

“normalisation of deviance”<sup>3</sup> came out of one main reason: Vaughan’s construct was reported within a strongly cohesive cultural context such as NASA’s. We believe that this is not the case here. By claiming organizational sensemaking to be lost in our case, we also inevitably discard the possibility of any cultural context (let alone a strong one) able to endorse a normalisation of deviance.

We think that the kind of visual estimation measurements used to control sand extraction may also fit in such “practical drifts”, although there was less information on this point.

Pervasive rule enacting is considered as slightly different from the first dimension. While prior rules were applied partially or differently than expected, here rules remain “untouched”. They simply allow for different interpretations and that is exactly what happens behind the non-evaluation of environmental impact in the case of sand extraction. In fact, ambiguities in procedures and rules were often reported as contributing factors to hazardous situations (Turner, 1978; Sagan, 1993).

A major difficulty we face in our interpretation, relies on the emergence and imposition balance.

Our documentary sources were not clear enough about whether restricted procedures for bridges’ assessment were first established from top or proposed or/and enacted at front-line and subsequently accepted at top level. We only know that management recognizes and endorses this practice as the only possible under the reported restrictions.

In either way, existing procedures would have been felt as undoubtedly risky, even more by those engaged in front line control. At this point, we wish to introduce here another HRO perspective. Weick et al. (2001b) state that organizations living at the edge of chaos clearly signal the mode they are operating in, differentiating between normal times or emergencies, for instance. Building on this, our idea is that most certainly, the emergency times endured by these organizations, were lived as normal ones. Therefore people kept doing what they always did as stressed by Weick et al. (2001b) about the Moura Mine disaster, where he comments how miners did natural things and wanted to be in control.

<sup>3</sup> “(...) at the time decisions were being made, each technical anomaly was first defined as an escalated risk; then, after engineering analysis, decision-makers redefined it as normal and acceptable. Each decision seemed logical, rational, and non-controversial as cumulatively they expanded the amount of technical deviation that was acceptable” (Vaughan, 2003, p. 447).

We know that continuous flow of information and action provide significant structures to daily living and that in the absence of news, people choose to acknowledge the inexistence of problems. There is room to believe that, whatever routine was established for all those people who did not leave IEP, and hence were probably subject to organizational non-sensemaking, it provided some sense of security, of normality, of control.

Once again we call on Perrow, when he stresses that all "(...) systems are human constructions, whether designed by engineers and corporate presidents, or the result of unplanned, unwitting, creative [?], slowly evolving human attempts to cope" (Perrow, 1999, p.351).

Besides, we can ask what kind of lessons to extract from organizations living at the edge of chaos while competing and struggling mainly for success (such as HRO), when we are here focusing organizations that encapsulated the edge of chaos into their inner core?

When analysing all constituent properties of the core phenomenon we have named "Boomerang management" as a global picture, we also can interpret strategies and impositions as efforts to run things well and error-prone practices as efforts to keep on going, in spite of and against all adversities.

Instead of issued by motivation, such actions and processes could eventually be linked to disinterest that was accredited to staff. Thus, ongoing activities were probably kept mostly by apathy or by inertia.

A further look and related comments:

This category is particularly difficult to grasp and interpret. This may result from 2 reasons: one, the fact that it covers many rich and relevant conceptual features; the other, the fact that theoretical frames applied here, often presented conflicting views.

We will highlight next, some of the issues worth revisiting here.

Backfire strategies addressed managerial decisions producing exactly the opposite effect they intended. Born of rational planning and coming from hierarchical imposition, they did not take into account individual and group response, one probable reason for the outcome of problems' aggravation.

Second-line correcting strategies, which followed, were then achieved. They hit the very heart of the organizations, if we analyse the results either through a classical systems' lens like Thompson's (1967) or through an interpretative lens like Weick's (2001).

Rules' topics that were discussed, are particularly controversial issues in the context of hazards / safety. We already mentioned that our data do not allow a clear understanding of the way those facilitating practices came to be.

Anyway, they became somehow "formalized" by top management. We can hypothesize this to be a peculiar form of rule by-passing, which makes it even more strange to interpret.

Our perspective is that those facilitating practices that emerge from operations level, can work whenever they make sense to the operator, and in case expertise is also located at that level. In such cases rule-breaking can, in our view, contribute to increasing safety against by-the-book complicated procedures.

On the contrary, facilitating practices formalized at top-level as ways to avoid restricting conditions, such as lack of resources, seem immensely dangerous. As Thompson also refers (1967), whenever individuals consider resources inadequate before uncertainty, they tend to avoid the exercise of discretion. I believe this may have happened on the Roads and Bridges domain, whenever IEP technicians were assigned to control bridges.

To conclude this part of the discussion it seems acceptable to interpret that individuals at front-line performed with lower technical capabilities, lacked sensemaking opportunities, avoided the exercise of discretion and thus more easily changed to any kind of routines that could decrease anxiety and mimicked their usual controlling performance role.

Finally, top management acceptance of drifts and interpretation of rules also provided a sense of normality to endangered institution's operations.

### Consequences

Focusing in the outcomes, we wish to highlight another issue: the disaster setting. The bridge of Hintze Ribeiro was the unfortunate site of convergence of a situation "when a large complex problem the limits and bounds of which were difficult to specify was being dealt with by a number of individuals usually operating in separate organizations and separate departments within organizations" (Turner, 1978, p.53).

Many features of Perrow's characterization of Complex Systems - such as proximity, interconnected subsystems, limited understanding - as well as of Tight Coupling - little slack in resources, unavailable alternatives, among other - figure in this case, and thus would easily predict, under NAT perspective, the occurrence of disaster (Perrow, 1999).

Besides such reinforced danger, organizations at each domain were also being subject to great strain due to diverse reasons and at different levels of their activity.

A further problem inside each domain was a disjointed perception of attributions that was noticed between units of the same organization (IEP's ICOR and ICERR) and among different organizations within the same domain (IND, DRAN and CPD). This obviously led to consequences on their performing roles.

At first, we considered a possible fit with the construct "variable disjunction of information", coined by Turner (1978). His construct was grounded in complex large settings and defined as "one in which the resources available to handle information are inadequate" (Turner, 1978, p.101) and where "the cost of information needed to reconcile information in one area or between one set of parties, precludes the expenditure of resources in other directions". (Turner, 1978, p. 52)

However, in our opinion there was a noticeable difference here. As each of the organizations involved acted independently over the site they were expected to manage and control, no information exchange was noticed from the articles nor, as it seems, even envisaged. A single and non-pursued intention of interaction was registered and reported at the Results section.

Findings that build into this final conceptual grouping, also confirm Turner's (1978) considering that any distinction between natural and man-made disasters is becoming increasingly blurred.

Thompson (1967) already referred that, at reciprocal interdependencies levels, coordination results from mutual adjustments, and requires increased attention to communication and decision, issued either by means of hierarchies or committees.

Coordination, in what refers to the Douro River domain and its diverse over-crossing organizations, is far away from the perception that emerged. This also seems to have been difficult for the three institutes of IEP. Therefore, coordination looks even more improbable in what refers to their mutual interaction, namely about the Hintze Ribeiro Bridge.

With his usual hindsight, Turner (1978) believes that, when important information necessary to prevent disasters is distributed among several organizations, non-routinized and non-institutionalized patterns of communication should be used. He even mentions "unusual acts" which could lead us to consider improvising solutions, such as the ones referred in Cunha (1999), which seem most unlikely in this case.

A curious aspect we would like to mention here on the outcome of this disaster, is about the victims' classification scheme, according to Perrow (1999). In the Entre-os-Rios disaster, victims were what he calls as "second party victims", the same as unoperating personnel. This is a perspective that considers systems' users as being associated to the system, although without having any influence over it. For

instance, third party victims have no involvement at all with the system, being just bystanders.

A further look and related comments:

Outcomes represent the resulting spot of all conditions previously discussed. Latent and precipitating conditions with their array of cascading and cumulative features converged into disaster.

Behind the maintenance of this bridge, 2 independent and non-interacting control domains were acting through different organizations, each of them suffering from several dysfunctional issues.

The encounter of those organizations, coupling together and with nature's own harsh conditions, resulted in a dramatic disaster such as the Entre os Rios bridge collapse.

### *Second approach to the discussion*

Until now, we have been analysing one single disaster and through it discussing many organizational issues. It is time to recall some of the main topics that were addressed so far: the amplifying power of higher-level decisions; responsibility and accountancy; the many roles of boundaries and the many approaches they generate; the exercise of control and what it conveys; conflict arising from power and time-space distances; pace in management; many issues of in-communication, learning and safety; corrective design or technological fixes and their effects; organizational technical core; rules and their complex approaches; top-level decisions' strategies and emergence; sensemaking; inter-organizational problems were among the topics mentioned.

Besides bringing rich perspectives to the discussion, many of these issues also raised conflicting views.

We now intend to revisit the Entre os Rios disaster and try to describe its storyline (such as we saw it from our analysis) in a more holistic and cursive mode.

It must be said at this point that the fact that it developed within public sector organizations seems irrelevant to our case. We believe that such distinctions are becoming blurred, as public service is increasingly depending on managerial and economic rules and assessments. On the other hand, private sector is increasingly required to consider ethical boundaries, operate within a framework of sustained global development, and expected to participate and contribute to social and cultural policies.

We believe that latent conditions to this kind of disaster exist at many levels. Higher-level decisions can cascade changes at organizational and interorganizational levels that, most often, carry with them new kind of problems.

In this case, the clustering of two organizational domains (the Road and Bridges' and the Douro River domains), both suffering from similar imposed reorganizations, resulted in the site which they were supposed to protect under their controlling attributions, - the bridge of Entre os Rios - becoming even more vulnerable.

Furthermore, the bridge of Hintze Ribeiro being located on an administratively deregulated, powerless and voiceless region also added to its tragic outcome.

Those who could, and in some ways tried, to alert to the bridge (local community and local authorities) were not able to make their voices heard because they were outsiders to a central dominant power that denied them intervening capacity. Although being geographically dispersed, central power authorities each at their different roles and positions acted, we believe, with groupthink characteristics. This had the effect of silencing any alerting role those forefront outsiders could have played.

Guidance, provided by inter-organizational clear boundaries' definition, failed. Both domains showed examples of acting in accordance to responsibility assumptions of some kind. Moreover, because responsibility areas were not clear, accountancy did not develop as well. Signs of this were also grounded in articles diagnosing this issue as being nation-wide. Many of the previously cited articles, reported arguments arising among heads of the organizations involved in the accident, each trying to push responsibility to the others.

Organizations in both domains were Controlling Bodies. Each of them was facing difficulties while accomplishing that role.

The Douro River domain was enabling a kind of control that benefited both controlled, and regulating agencies. Sand extraction had become legalized and by this the activity, far from being controlled, reportedly flourished instead.

Besides this, controllers also used quick-and-easy estimation measurements. However, in this case there were not enough elements for us to know if this had taken place as an emergent process to facilitate front-line work, being initially carried at that level, and later "officially recognized" from to the top. Another possibility is the procedures having been "officially" established top-down, as we believe was the case in the Roads and Bridges' domain.

Intra-organizational situation was particularly complicated in the Roads and Bridges domain of activity. In the past, they had a well-defined and long-established

organizational identity, and recognized technical expertise. Times changed this image of JAE.

Many kind of resources were failing. There existed no instruments (increasingly becoming technology-based and therefore requiring more resources) either for information, evaluation and control of the social equipment to be supervised. Knowledgeable people were leaving. There were accusations of corruption.

Furthermore, management's correcting strategy that was applied did not work. Organizational splitting into 3 institutes neither provided clear guidance into their reciprocal boundaries, nor solved, by means of administrative changes, the resources' problem it specifically had intended to address. Even more people left, thereby forcing to another corrective action, this time by bringing young non-experienced politicians, less-specialized staff, into top management roles. Moreover, in some cases core operations, like bridge assessments, were attributed to external firms.

The organizational bias of insiders' unicity of perspectives, became reinforced by bringing in more people from those established in power. From this, any possible dissonance would be misread and / or avoided.

On the other hand, outsiders (external firms), did not bring what could have been fresh perspectives and added-value information to share with to the same level of expertise, once their results were transmitted by reports and most probably sent directly to top level management.

Technical core competences were not buffered; they became the very heart of the problem instead.

We believe that the organizations in charge of the bridges' domain became deeply sick. Loss of motivation and unhappiness of people that still kept their jobs in the new structures must have ensued. We can wonder what kind of organization were these people shaping together by those times? Most probably one without technical self-esteem, without memories to embed in, without top-level trust, without knowledge to share.

We also believe that people kept their organizations alive by acting, and daily reproducing the increasingly narrower functions they were able to maintain and – together with management agreement - dropping out all those that the shortage of resources did not allow. Management acknowledged performing low-level safety evaluation procedures, on the grounds that they were the only ones that could be made under the circumstances. If by any chance specialized internal staff engineers had any kind of doubt about the risks of applying this limited procedure, their

exercise of discretion would be limited, being outsiders to top management. In truth, they must have avoided initiative.

One dangerous conclusion that could come as a logical consequence of many of the previous thoughts, would be the well-known tendency to strengthen defence mechanism and normalization procedures, (i.e.) to offer a reverse and extreme perspective of guidance and control. In reality, strong security moves have generally been recognized as post-disaster trends.

However, our specialist-writers also alert to dangers resulting from excessive defences (Reason, 1997), as mechanisms of planning, and as TQM drawbacks (Weick et al., 2001b).

Once again, as a pioneer studios of disaster issues, Turner (1978) early highlighted the dangers of rational planning. In spite of identifying failure to comply with regulations as one contributing factor to disasters, he recognizes not knowing which better option to take. He also acknowledges that normalization will sacrifice the opportunity to generate variety in options.

It is important to recall here, that those kind of conditions that are most likely to constitute a safety threat, relate to basic organizational processes and therefore to everyday business management. Moreover, as Reason (1997) accurately points safety is an elusive non-event. Therefore, it is not surprising that people generally choose the feeling of safety and act accordingly. All these issues make this topic even more elusive and difficult to handle.

Besides, under what conceptual framework can we understand the incredible episode narrated by Sagan (1993) when the decision to launch a nuclear bomb was kept for a while in the hands of a single USA pilot? This is just one among many similar examples Sagan uncovered in his research focusing American nuclear power during Cold War. The striking about this episode is that it happens in the context of a highly hierarchical system, protected with extreme levels of redundancy, at the heart of the most powerful nation's safety!

We wish to cite once more Ezequiel (2001), when writing about the difficult procedures for bodies' recovery. Extremely bad weather conditions made this a daunting task. The officer (a well-educated, master graduated specialist) recalls "Tudo corria mal. Por mais tentativas e planeamento que se fizessem, nada acontecia como previsto" (Ezquiel et al., 2001, p.109).

Maybe we could have turned here to complexity research, as it is considered to provide insight into the context-specific relational interactions within and between organizational entities (Bradbury, & Lichtenstein, 2000, p.557).

Stacey, for instance, mentions: "When one ignores the shifts in power relations and insider/outsider dynamics generating and generated by change, one is taken by surprise at the unexpected turns that change takes" (Stacey, 2001, p.156). Arguments could be made here on the grounds that Stacey is focusing intraorganizational level. Counter arguments would then rely on the fact that fractal processes require a same level of understanding and that "there is no separation between individuals as one level and groups, organizations and societies at another level" (Stacey, 2001, p. 6).

Perhaps we may reach a better understanding of the unexpected turns that change took in the Entre os Rios disaster case by this way...

### *Validity of results*

Presentation of this criterion after our prior epistemological claims can be seen as a paradox. For many social scientists in general, and to qualitative researchers in particular, criteria such as validity and reliability became increasingly controversial (Miller et al., 2003; Schwandt, 2001).

Taking this in account, we will nevertheless try to reach a compromise with the academic values it presumes, and our own research goals as well.

In the particular theory building mode that was used in our study, generalizability of findings do not rely on the extent of their expression on a population, but on the "plausibility of the theorized elements" (Locke, 2001, p.39).

Accuracy of the findings, in such extreme qualitative study, will be determined from the standpoint of the researcher and readers, and was looked for during all steps of the research process, as well as during data presentation and discussion (Cresswell, 2003).

Following the advice of Cresswell, (2003) we hope to have used at least some of the eight strategies he recommends to enable checking accuracy of the findings:

While conveying our results we tried to use a thick description also connected to the source-articles.

We tried, in every possible way, to present our uncertainties and clarify our biases.

We also tried to present negative information, whenever acknowledged.

We also have counted with peer debriefing. By discussing the overall work with two colleagues from our master course, we were given the opportunity to see things though external eyes, and our work became enriched from this. In a different way,

we believe that orientators also assume such a role. By reviewing our work and asking questions, ours also contributed to enhancing the accuracy of this study.

### *Limitations and contributions of this study*

A first limitation we wish to underline, is the fact that we only used one kind of source. Triangulation (Cresswell, 2003) with other data sources would have been enriching, and another important contribution to validity.

A second limitation is at the same documentary sources' level. We think our study would have benefited from expanding data analysis to other daily newspaper (Diário de Notícias and Jornal de Notícias), as well as news magazine, (Visão) for instance.

A third constraint may result from data limits that were established. Articles about the subject kept being published after the established study deadline, mainly at the occasion of the first anniversary celebration. Although decreasingly invasive in quantity terms, as it usually happens with mass media subjects, they could have added new data to the analysis.

As to the contributions of the present study:

The scope of our study, and the importance it is increasingly receiving in scientific areas among which organizational studies, can constitute, we believe, a major contribution by itself.

Cunha et al (2003) put "Desastres de origem humana" among twenty-one themes and debates for the twenty first century and even cite the Entre os Rios disaster among a few others deserving organizational investigation.

Weick et al. (2001b) wrote their book after a so-called "Michigan School's Pressing Problems initiative" listed forty-five most pressing problems identified by executives. The authors realized that "those forty-five problems, almost without fail, involved a lapse in reliability" (Weick et al., 2001b, p.xiv). They noticed that, whether relating to strategic thinking or managing high performance climate, executives were listing pressing problems that came out from small and unexpected things, slowly building up without notice. Weick's book uses a great deal of accidents' examples and the fact that it was published in the "University of Michigan Business School Management Series: innovative solutions to the pressing problems of business" clearly illustrates the link between both fields.

Environmental turbulence and businesses' increasing pace have been cited among the many reasons justifying a rising attention towards safety, together with the emphasis in studying disasters.

We also believe that our study can add to the accident-wide research findings in some different ways.

First, at a wider, international level, we noticed that bridge accidents were much less frequently cited, even in large disasters' lists, than other kind of accidents (just one included by Chiles, 2001, p. 295-312; none in the listing by Peterson, 1996, p. 385-391). However, from readings that were developed, reference was later found to a study published in 1980 by Blockley and cited by Pidgeon (1997) of 84 bridge collapses that appears to be undoubtedly important (although it was not made available to us). Being himself a structural engineer, the author concluded that none of the accidents analysed came from technical causes. Instead, they all resulted from managerial failures whether in design construction, maintenance or use. Given the time lapse between Blockley's wide study and our own narrow one, this particular analysis may still add something to bridge collapses within the wider disaster's field.

Second, at a national level. Although some pioneers like Turner (1978) opened the way much ahead of others, the field has been receiving new and multidisciplinary approaches, as it can be easily testified through Internet document search. In what refers to Portuguese literature, we were not able to find any study being specifically based on an organizational analysis of disasters. We therefore expect to help on calling attention to an area that is both important as a research field, and motivating to the investigator as well.

Hopefully, better understanding of what contributed to the occurrence of this specific disaster can be transferred to other settings, and therefore also play a role into improved safety prospects.

As Turner writes on an ironic prescriptive article about how to organize disasters: "More than ever before in history, the capacity and the techniques for organizing large-scale disasters are universally available. One day the applications of this new discipline may exceed man's wildest expectations." (Turner, 1976a, p.105)

### *Suggestions for further studies*

Suggestions derived from the limitations previously mentioned, will be first cited, being viewed as ways to further extending and enriching our study.

Triangulating actual findings with other documentary sources would be a first step, considering either reports from commissions that were appointed to investigate the accident, either archival documents from the organizations involved. Taking into

account that not enough time has elapsed, and once this is still a sensitive subject, a possible problem would be obtaining access to those documents.

Focusing other important shareholders, like sand extraction organizations for instance, would certainly enrich the analysis. Source articles did not provide useful data on them.

Interviewing staff (from different levels) of each of the institutions involved in the accident, including people working at different times of their organizational lives, would certainly bring forth valuable perceptions, although biases about justifying their own actions and protecting their reputations is always to be considered, with the exception of the initial moments following any occurrence (Weick, 2001b).

At a more specific level, we would propose for instance, trying to elaborate on more precise management definitions: eventual analysis of the tasks performed at each level would probably help defining the kind of managerial profiles that were active, although intraorganizational, organizational and interorganizational levels would also have to be distinguished for this.

Suggestions that emerged during the study itself and therefore we believe may become valuable for further studies on this area will be mentioned now.

Conceiving a research design that would involve the participation of several specialists of different scientific areas seems to be highly desirable in this field. We believe that besides being innovative as a research approach, it would certainly bring most enriching results.

Besides raising multidisciplinary issues, this field also generates interlinkages among many important organizational themes. This becomes obviously a second source of suggestions to further research developments.

We will briefly refer to some of them, trying to avoid adopting any prescriptive view in such listing:

Rule breaking as a hazard condition and as an innovation factor.

Culture and identity under organizational disruption.

Identifying situations where emergence articulates with imposed decisions.

Identifying possible models of organizational interplay.

Reversely, empirical research on decision-making, leadership, multilevel analysis, organizational interrelations and many other organizational issues will also have impact in this area as well.

## CONCLUSION

When we decided to elaborate our study on the Entre-os-Rios disaster, we had no other prior expectation than to understand what were the organizational processes involved in the development of the accident.

The fact that we relied on Grounded Theory as our research methodology, contributed to assure, as much as this can be possible, an unbiased approach to data. It also enabled the emergence of concepts not influenced by previous literature reading in this area. Indeed, literature review only took place at a much later phase of the analysis, as recommended in Grounded Theory.

At the end of our study, we have argued for the presentation of 2 core concepts which we labelled as "Front and back span" and "Boomerang management". We believe that they represent major processes in the development of this disaster, as detailed in our text.

Latent conditions for the Entre-os-Rios disaster were gradually accumulating for many years before the emergence of precipitating events, which coupled man and nature altogether and actively determined the tragic outcome.

Hintze Ribeiro Bridge (with its specific setting, the Douro River) was under the supervision of 2 organizational systems, here called domains, each of them acting in a state of independence and unawareness of the other and thereby of their reciprocal influences as well.

Both organizational domains had been the object of major top-decided re-engineering changes some years before, and each was suffering from different, yet to some point similar, problems and thus enduring organizational difficulties. The coupling of two such deregulated domains reinforced the already existing hazardous potential. The fact that both were Controlling Bodies further added to this situation.

Furthermore, Hintze Ribeiro Bridge was located on a region suffering from severe isolation characteristics, which, although being mostly political in nature, had been long established and therefore encompassed more than one political party. These were some of the issues behind the construct of "Front and back span".

During our analysis, we have identified many organizational issues also stressed by authors who specialized in the area of disaster. They have been thoroughly described and discussed as such, and will not be further addressed here.

However, we also identified some specific features that did not fit into the literature review undertaken. We believe they can be considered as new issues in the field of disasters.

One such finding was the property we have called "Backfire strategy", by which rational planning achieved results that were exactly the opposite of their strategic aims. We think that the reason for this did not lie in "sloppy" decisions, once they appear instead as appropriate, rational and economic decisions in their specific context. Why they turned so wrong is difficult to understand, although we believe that one main reason may lay in the fact that people, their expectations and their will, did not appear to be taken into account as an important variable to the outcome of such strategic processes.

Whenever "second-round" corrective strategies were launched in order to reach their (initially missed) targets, results were even worse. In spite of achieving their aims, such emergency, second time strategies apparently damaged nuclear parts of the organization and thereby must have seriously contributed to the disaster.

Another characteristic that seemed distinct from literature, was the one described as groupthink as applied to dominant political parties. Whether located at interorganizational or organizational levels, this feature was also regarded as one of the contributing factors to this disaster.

Many of our research results were complex, contradictory and difficult to understand. We are well aware that the interpretations being offered can be among alternative views for the same findings.

Anyway, at the end of our presentation it is our opinion that the Entre-os-Rios bridge collapse adequately illustrates why disaster cases are increasingly being studied through organizational lenses.

At the beginning of our work, we referred to the area of accidents as a specific field of research. We now think that it can be acknowledged as one of the richest and encompassing ones in Organizational Studies, as it deals with many of the most important issues within this area.

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**APPENDIXES**

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**APPENDIX A**

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LIST OF SOURCE ARTICLES FROM "O PÚBLICO"

## PÚBLICO

Datas	Fonte	Título da peça (título principal)	Autor	Pag.s	Referência atribuída
2001.03.05	PUBL	Dados			Pbd010305PUBLdados
2001.03.05	PUBL	Ponte de Entre-os-Rios caiu e arrasou autocarro	Manuel Carvalho		Pbd010305PUBLponte
2001.03.06	PUBL	"Cada um safava-se como podia"	PG	9 Desta <sup>que</sup>	DN010306PUBLcadaum
2001.03.06	PUBL	"Never more"	[Ana Sá Lopes]		Pbd010306PUBLnever
2001.03.06	PUBL	"Vi os pilares a cairem e o autocarro a mergulhar no rio"	AAM/JAM	3 Desta <sup>que</sup>	DN010306PUBLvios
2001.03.06	PUBL	366 curvas	[Rui Baptista; Inês Nadais]		Pbd010306PUBLtrezentas
2001.03.06	PUBL	A fragilidade de um país (Editorial)	José Manuel Fernandes	3 Desta <sup>que</sup>	DN010306PUBLfragilidade
2001.03.06	PUBL	A invasão dos institutos pelos "boys"	LMV	8 Desta <sup>que</sup>	DN010306PUBLinvasao
2001.03.06	PUBL	A noite em que o ministro caiu	Eduardo Dâmaso	5 Desta <sup>que</sup>	DN010306PUBLanoite
2001.03.06	PUBL	As frases da demissão			Pbd010306PUBLfrases
2001.03.06	PUBL	Atrasos de vários meses	[Leon <sup>ete</sup> Botelho; RuiBapt <sup>ista</sup> ]		Pbd010306PUBLatrasos
2001.03.06	PUBL	Cada um safava-se como podia	PG		Pbd010306PUBLcada
2001.03.06	PUBL	Como se detecta um autocarro no fundo do rio?	AG	4 Desta <sup>que</sup>	DN010306PUBLcomose
2001.03.06	PUBL	Do viaduto Duarte Pacheco à Portela	[Cl <sup>ia</sup> Viana; Idá <sup>rio</sup> Revez; CDias]		Pbd010306PUBLdoviaduto
2001.03.06	PUBL	Dois engenheiros civis em três administrações		9 Desta <sup>que</sup>	DN010306PUBLdoisenge
2001.03.06	PUBL	Estado paga tudo			Pbd010306PUBLestado
2001.03.06	PUBL	Estradas ou campos de buracos?	[Cl <sup>ia</sup> Viana; Idá <sup>rio</sup> Revez; CDias]		Pbd010306PUBLestradas
2001.03.06	PUBL	Falta fiscalização	[Leonete Botelho et al.]		DN010306PUBLfalta
2001.03.06	PUBL	Foi-se o bombeiro	Ana Sá Lopes	6 Desta <sup>que</sup>	DN010306PUBLfoise

<b>PÚBLICO</b>					
<b>Datas</b>	<b>Fonte</b>	<b>Título da peça (título principal)</b>	<b>Autor</b>	<b>Pag.s</b>	<b>Referência atribuída</b>
2001.03.06	PUBL	Governo afirma desconhecer o perigo iminente	[J <sup>o</sup> A <sup>o</sup> Mo <sup>ra</sup> ,A <sup>o</sup> Ar <sup>do</sup> Mesq <sup>ia</sup> ,R <sup>o</sup> S <sup>za</sup> ]		Pbd010306PUBLgoverno
2001.03.06	PUBL	Guterres obrigado a mini-remodelação	Luciano Alvarez	6 Desta <sup>que</sup>	DN010306PUBLguterres
2001.03.06	PUBL	Irresponsabilidade e impunidade	Vital Moreira		Pbd010306PUBLirrespons
2001.03.06	PUBL	Jorge Coelho regressa ao Parlamento	ED/JPH	5 Desta <sup>que</sup>	DN010306PUBLjorge
2001.03.06	PUBL	Listagem de 55 das vítimas			Pbd010306PUBLlistagem
2001.03.06	PUBL	Listagem de 55 dos desaparecidos		11Dest <sup>aque</sup>	DN010306PUBLlistagem
2001.03.06	PUBL	Mau tempo dificulta operação de busca	Rita Siza	4 Desta <sup>que</sup>	DN010306PUBLmau
2001.03.06	PUBL	Nova ponte só estará pronta dentro de três anos	Leon <sup>ete</sup> Botelho;RuiBaptista	11Dest <sup>aque</sup>	DN010306PUBLnova
2001.03.06	PUBL	O desastre que pôs Portugal de luto	J <sup>o</sup> A <sup>o</sup> Mo <sup>ra</sup> ,A <sup>o</sup> Ar <sup>do</sup> Mesq <sup>ia</sup> ,R <sup>o</sup> S <sup>za</sup>	2-3 Dest <sup>aque</sup>	DN010306PUBLdesastre
2001.03.06	PUBL	Ponte à beira da derrocada no Algarve	[Cl <sup>ra</sup> Viana;Idá <sup>lo</sup> Revez;CDias]		Pbd010306PUBLpontaigar
2001.03.06	PUBL	Ponte centenária não resistiu a sucessão anormal de cheias	Pedro Garcias et al.	8 Desta <sup>que</sup>	DN010306PUBLponte
2001.03.06	PUBL	População gritou contra os políticos	RS		Pbd010306PUBLpopulação
2001.03.06	PUBL	Portugal num estado de insegurança	Cl <sup>ra</sup> Viana;Idá <sup>lo</sup> Rev <sup>ez</sup> ;CDias	9 Desta <sup>que</sup>	DN010306PUBLportugal
2001.03.06	PUBL	Pressões demissionárias sobre responsável pelas pontes	Isabel Braga	7 Desta <sup>que</sup>	DN010306PUBLpressoes
2001.03.06	PUBL	Raiva chora em silêncio	Inês Nadais;RB;AAM;RS	10Dest <sup>aque</sup>	DN010306PUBLraiva
2001.03.06	PUBL	Reacções	[Isabel Braga]		DN010306PUBLreacções
2001.03.06	PUBL	Sacudidos pelo estrondo	AAM/JAM		Pbd010306PUBLsacudidos
2001.03.06	PUBL	Tenho aí a minha mãe	AAM	4 Desta <sup>que</sup>	DN010306PUBLtenhoai
2001.03.06	PUBL	Tragédia da ponte	diagrama imagens		P010306PUBLtragédia

## PÚBLICO

Datas	Fonte	Título da peça (título principal)	Autor	Pag.s	Referência atribuída
2001.03.06	PUBL	Três administrações, só dois engenheiros civis	[Leonete Botelho et al.]		Pbd010306PUBLtrês
2001.03.06	PUBL	Um autarca teimoso	Rui Baptista	4 <i>Destaque</i>	DN010306PUBLautarca
2001.03.06	PUBL	Um concelho esquecido pelos políticos	Rui Baptista; Inês Nadais	10 <i>Destaque</i>	DN010306PUBLconcelho
2001.03.06	PUBL	Uma morgue sem cadáveres	Inês Nadais	11 <i>Destaque</i>	DN010306PUBLmorgue
2001.03.06	PUBL	Vi os pilares a cair e o autocarro a mergulhar no rio			Pbd010306PUBLvi
2001.03.06	PUBL	Vieram morrer à terra deles	[Inês Nadais; RB; AAM; RS]		Pbd010306PUBLvieram
2001.03.06	PUBL	Visita em Janeiro não detectou qualquer perigo	Leonete Botelho et al.	9 <i>Destaque</i>	DN010306PUBLvisita
2001.03.07	PUBL	Como funciona o sonar lateral	Teresa Firmino		Pbd010307PUBLcomo
2001.03.07	PUBL	Conservação das pontes sem responsáveis claros	Leonete Botelho; Cláudia Barata		Pbd010307PUBLconservaç
2001.03.07	PUBL	Familiares com informações de duas em duas horas	Rui Baptista		Pbd010307PUBLfamiliaresin
2001.03.07	PUBL	Familiares das vítimas descarregam indignação em Jorge Sampaio	Pedro Garcias		Pbd010307PUBLfamiliares
2001.03.07	PUBL	Governador civil nega responsabilidades	Rui Baptista		Pbd010307PUBLgovernador
2001.03.07	PUBL	Mais duas pontes caem em Famalicão e Santo Tirso	Emília Monteiro		Pbd010307PUBLmais
2001.03.07	PUBL	Marinha admite recorrer a ajuda internacional	[Rui Baptista]		Pbd010307PUBLmarinha
2001.03.07	PUBL	MP de Castelo de Paiva apura responsabilidades criminais	António Arnaldo Mesquita		Pbd010307PUBLmp
2001.03.07	PUBL	Muitas pontes ferroviárias são contemporâneas da ponte de EoR...	Carlos Cipriano		Pbd010307PUBLmuitas
2001.03.07	PUBL	Paulo Teixeira reafirma que Secretário de Estado foi avisado	Rui Baptista		Pbd010307PUBLpaulo
2001.03.07	PUBL	Perícias complexas	[António Arnaldo Mesquita]		Pbd010307PUBLpericias
2001.03.07	PUBL	Ponte da Foz do Lizandro em perigo	Samuel Alemão		Pbd010307PUBLponte

## PÚBLICO

Datas	Fonte	Título da peça (título principal)	Autor	Pag.s	Referência atribuída
2001.03.07	PUBL	Pontes alentejanas em perigo	Carlos Dias		Pbd010307PUBLpontes
2001.03.07	PUBL	Presidente do Instituto das Estradas de Port <sup>gal</sup> pôs o lugar à dispo...	Isabel Braga		Pbd010307PUBLpresidente
2001.03.07	PUBL	Resgate dos corpos começará hoje	Rui Baptista		Pbd010307PUBLresgate
2001.03.07	PUBL	Sampaio compara acidente de Entre-os-Rios c/ submarino "Kursk"	[Rui Baptista]		Pbd010307PUBLsampaio
2001.03.07	PUBL	Um Inverno arrasador	Clara Viana		Pbd010307PUBLinverno
2001.03.08	PUBL	"É ali que está o avô?"	Rui Baptista		Pbd010308PUBLéali
2001.03.08	PUBL	"Ferry-boat" é uma hipótese	[Rui Baptista]		Pbd010308PUBLferry
2001.03.08	PUBL	"Ficar à margem"			Pbd010308PUBLficar
2001.03.08	PUBL	"Há falta de meios"	[InêsGSeque <sup>ra</sup> , Eun <sup>e</sup> Lour <sup>co</sup> ]		Pbd010308PUBLháfalta
2001.03.08	PUBL	(Perguntas e Respostas)			Pbd010308PUBLp&r
2001.03.08	PUBL	António Martins afastado do Instituto de Estradas	InêsGSeque <sup>ra</sup> , Eun <sup>e</sup> Lour <sup>co</sup>		Pbd010308PUBLantónio
2001.03.08	PUBL	AR exige soluções	[InêsGSeque <sup>ra</sup> , Eun <sup>e</sup> Lour <sup>co</sup> ]		Pbd010308PUBLar
2001.03.08	PUBL	Areias rendem 850 mil contos	[Pedro Garcias]		Pbd010308PUBLareias
2001.03.08	PUBL	Autarquia reclama plano de emergência para Castelo de Paiva	Rui Baptista		Pbd010308PUBLautarquia
2001.03.08	PUBL	Cadáveres foram arrastados para o mar?	[Rui Baptista]		Pbd010308PUBLcadáveres
2001.03.08	PUBL	Cinco órfãos numa casa	Leonete Botelho		Pbd010308PUBLcinco
2001.03.08	PUBL	Corrente do rio vai continuar alucinante	Celeste Pareira		Pbd010308PUBLcorrente
2001.03.08	PUBL	Depósito de areias roubou 50m ao rio	Pedro Garcias		Pbd010308PUBLdepósito
2001.03.08	PUBL	Douro indomável impede operação de resgate	Rui Baptista		Pbd010308PUBLdouro

<b>PÚBLICO</b>					
<b>Datas</b>	<b>Fonte</b>	<b>Título da peça (título principal)</b>	<b>Autor</b>	<b>Pag.s</b>	<b>Referência atribuída</b>
2001.03.08	PUBL	Governo paga indemnizações sem esperar pelos tribunais	AAM		Pbd010307PUBLgoverno
2001.03.08	PUBL	Instituto reconhece irregularidades dos areeiros	PG		Pbd010308PUBLinstituto
2001.03.08	PUBL	Mergulho arriscado e infrutífero	Pedro Garcias		Pbd010308PUBLmergulho
2001.03.08	PUBL	Nenhuma ponte cai sem avisar	Luis Miguel Viana		Pbd010308PUBLnenhuma
2001.03.08	PUBL	O auxílio em números			Pbd010308PUBLauxílio
2001.03.08	PUBL	O que ganha António Martins			Pbd010307PUBLoque
2001.03.08	PUBL	Orçamento da ponte em 1885			Pbd010308PUBLorçamento
2001.03.08	PUBL	Os ensinamentos de Edgar Cardoso	PG		Pbd010308PUBLensinam
2001.03.08	PUBL	Pai teve um colapso cardíaco por causa da morte do filho			Pbd010308PUBLpai
2001.03.08	PUBL	Pasei naquela ponte centenas de vezes e sempre me assustou	Liliana Garcia		Pbd010308PUBLpassei
2001.03.08	PUBL	Pilar assente em estacaria de madeira			Pbd010308PUBLpillar
2001.03.09	PUBL	"Os Verdes" questionam Sócrates sobre remoção de areias	SJA		Pbd010309PUBLosverdes
2001.03.09	PUBL	"Seafaring bodies"	[Ana Peixoto Fernandes]		Pbd010309PUBLseafaring
2001.03.09	PUBL	A besta de Entre-os-Rios	Pedro Garcias		Pbd010309PUBLbesta
2001.03.09	PUBL	A operação em números			Pbd010309PUBLoperação
2001.03.09	PUBL	Ao sabor da corrente	Miguel Sousa Tavares		Pbd010309PUBLaosabor
2001.03.09	PUBL	AR aprovou apoios	EL		Pbd010309PUBLar
2001.03.09	PUBL	Barros Moura diz que o inquérito é para "estimular o Governo"	SJA		Pbd010309PUBLbarros
2001.03.09	PUBL	Causas do acidente poderão ser conhecidas dentro de 15 dias	CCP		Pbd010309PUBLcausas

## PÚBLICO

PÚBLICO					
Datas	Fonte	Título da peça (título principal)	Autor	Pag.s	Referência atribuída
2001.03.09	PUBL	Cheias e areias apontadas como causas da erosão	TF		Pbd010309PUBLcheias
2001.03.09	PUBL	Correntes a 22 quilómetros	[Leonete Botelho]		Pbd010309PUBLcorrentes
2001.03.09	PUBL	Correntes do mar terão levado cadáveres para Norte	Leonete Botelho		Pbd010309PUBLcorrente
2001.03.09	PUBL	Governador Civil pede informação sobre pontes	Jorge Talixa		Pbd010309PUBLgovernador
2001.03.09	PUBL	IND responde a Sócrates e a Martins			Pbd010309PUBLind
2001.03.09	PUBL	Martins pediu demissão pressionado por Ferro			Pbd010309PUBLmartins
2001.03.09	PUBL	Mistério das fundações continua por esclarecer	Teresa Firmino		Pbd010309PUBLmistério
2001.03.09	PUBL	O fenómeno de erosão local junto aos pilares			Pbd010309PUBLfenómeno
2001.03.09	PUBL	PS propõe inquérito parlamentar ao acidente de Entre-os-Rios	São José Almeida		Pbd010309PUBLps
2001.03.09	PUBL	Quatro corpos encontrados na Galiza	Cel <sup>o</sup> Pereira,PedroGarcias		Pbd010309PUBLquatro
2001.03.09	PUBL	Roupas ajudaram à identificação	Ana Peixoto Fernandes		Pbd010309PUBLroupas
2001.03.09	PUBL	Sócrates responde	[SLA]		Pbd010309PUBLsócrates
2001.03.09	PUBL	Vigilância costeira	[Cel <sup>o</sup> Pereira,PedroGarcias]		Pbd010309PUBLvigilância
2001.03.10	PUBL	"Lá em baixo encontrei a noite"	Rui Baptista		Pbd010310PUBLlá
2001.03.10	PUBL	"Quanto mais tempo..."	[Ana Cristina Pereira]		Pbd010310PUBLquanto
2001.03.10	PUBL	A mulher que veio do Sul	CCP/ACP		Pbd010310PUBLmulher
2001.03.10	PUBL	António Guterres fecha a porta a novas demissões	Luciano Alvarez		Pbd010310PUBLantónio
2001.03.10	PUBL	As horas lentas da espera	Ana Cristina Pereira		Pbd010310PUBLhoras
2001.03.10	PUBL	Corpos de volta a Csatelo de Paiva	RuiBapt <sup>ta</sup> ,AnaPeix <sup>o</sup> Fern <sup>des</sup>		Pbd010310PUBLcorpos

## PÚBLICO

Datas	Fonte	Título da peça (título principal)	Autor	Pag.s	Referência atribuída
2001.03.10	PUBL	Direcção de Estradas do Porto alertou para o pilar errado	Pedro Garcias		Pbd010310PUBLdirecção
2001.03.10	PUBL	Explosão de dor no funeral			Pbd010310PUBLexplosão
2001.03.10	PUBL	Instituto das Estradas não explica mistérios			Pbd010310PUBLinstituto
2001.03.10	PUBL	Juíza galega afastada por "burocracia excessiva"	Ana Peixoto Fernandes		Pbd010310PUBLjuíza
2001.03.10	PUBL	O bombeiro descrente			Pbd010310PUBLbombeiro
2001.03.10	PUBL	PGR substitui titular do inquérito	João Pedro Henriques		Pbd010310PUBLpgr
2001.03.10	PUBL	PS adia congresso por um mês	Nuno Ribeiro		Pbd010310PUBLrecolher
2001.03.10	PUBL	Recolher cadáveres alheios	[Luciano Alvarez]		Pbd010310PUBLsampaio
2001.03.10	PUBL	Sampaio pede apuramento rigoroso da verdade			Pbd010310PUBLsentinelas
2001.03.10	PUBL	Sentinelas no rio	IsabelBraga;HelenaPereira		Pbd010310PUBLsócratesna
2001.03.10	PUBL	Sócrates "não tem nada que ver com nada" afirma gabinete do min...	[João Pedro Henriques]		Pbd010310PUBLsócrates
2001.03.10	PUBL	Sócrates queria remodelação alargada	António Arnaldo Mesquita		Pbd010310PUBLtribunal
2001.03.10	PUBL	Tribunal Constitucional fiscaliza Cravinho	Rui Baptista		Pbd010311PUBLhomenage
2001.03.11	PUBL	Homenagem junta políticos de todas as cores			Pbd010311PUBLpj
2001.03.11	PUBL	PJ do Porto identifica cadáveres na Galiza			Pbd010311PUBLtodas
2001.03.11	PUBL	Todas as atenções no litoral galego			
2001.03.11	PUBL	Uma tomada de posse entre Jorge Coelho e Ferro Rodrigues	Nuno Sá Lourenço	Internet	DN010315PUBLtomada
2001.03.12	PUBL	Chorar os mortos e a interioridade	Inês Nadais		Pbd010312PUBLchorar
2001.03.12	PUBL	Mais meios aéreos e humanos	ACP		Pbd010312PUBLmais

## PÚBLICO

Datas	Fonte	Título da peça (título principal)	Autor	Pag.s	Referência atribuída
2001.03.12	PUBL	Na televisão como uma tragédia grega	Eduardo Cintra Torres		Pbd010312PUBLtelevisão
2001.03.12	PUBL	Objecto detectado era bateião apodrecido	AnaCristinaPereira c/Lusa		Pbd010312PUBLObjecto
2001.03.12	PUBL	Políticos preferiram o silêncio	[Inês Nadais]		Pbd010312PUBLpolíticos
2001.03.13	PUBL	Areiros ilegais	Pedro Garcias		Pbd010313PUBLareiros
2001.03.13	PUBL	Como se comportaram os "media" em Entre-os-Rios ?	Sofia Rodrigues		Pbd010313PUBLcomo
2001.03.13	PUBL	Governo aluga "ferry-boat" a areiro	Pedro Garcias		Pbd010313PUBLgoverno
2001.03.13	PUBL	Governo nega retirada ilegal de areias no rio Douro	Ana Sá Lopes		Pbd010313PUBLgovernoneg
2001.03.13	PUBL	Legislação permissiva			Pbd010313PUBLlegislação
2001.03.13	PUBL	Macas e bombeiros nas brincadeiras da escola			Pbd010313PUBLmacas
2001.03.13	PUBL	Mais um corpo encontrado na Galiza	A <sup>na</sup> p <sup>hoto</sup> Fern <sup>des</sup> ,S <sup>dra</sup> S <sup>ta</sup> C <sup>o</sup> /Lu		Pbd010313PUBLmais
2001.03.13	PUBL	Modelos simulam deslocação dos corpos	Teresa Firmino		Pbd010313PUBLmodelos
2001.03.13	PUBL	Um negócio que dasafia o Estado			Pbd010313PUBLnegócio
2001.03.14	PUBL	Comissão de inquérito está ferida de morte	Pedro Garcias		Pbd010314PUBLcomissão
2001.03.14	PUBL	Como se comportaram os "media" em Entre-os-Rios ?	Sofia Rodrigues	Internet	DN010314PUBLcomose
2001.03.14	PUBL	Dados sobre a barragem	[Pedro Garcias]		Pbd010314PUBLdados
2001.03.14	PUBL	Descargas da Barragem do Torrão sob suspeita	Pedro Garcias		Pbd010314PUBLdescargas
2001.03.14	PUBL	Governo paga subsídios a quem não pode ir trabalhar	CP		Pbd010314PUBLgoverno
2001.03.14	PUBL	Oitava vítima foi sepultada ontem	CP		Pbd010314PUBLoitava
2001.03.14	PUBL	Problema nas comportas?	[Pedro Garcias]		Pbd010314PUBLproblema

<b>PÚBLICO</b>					
<b>Datas</b>	<b>Fonte</b>	<b>Título da peça (título principal)</b>	<b>Autor</b>	<b>Pag.s</b>	<b>Referência atribuída</b>
2001.03.14	PUBL	Sangria de quadros	[Teresa Firmino]		Pbd010314PUBLsangria
2001.03.14	PUBL	IEP sem técnicos para inspeccionar pontes	Teresa Firmino		Pbd010314PUBLIep
2001.03.14	PUBL	Tribunal de Contas da UE aponta irregularidades na Ponte Vasco...			Pbd010314PUBLtribunal
2001.03.15	PUBL	A perigosa dependência da indústria tradicional	Joana Amorim		Pbd010315PUBLperigosa
2001.03.15	PUBL	A verdade está no fundo do rio	Pedro Garcias		Pbd010315PUBLverdade
2001.03.15	PUBL	África a 50 quilómetros da Capital da Cultura	Rui Baptista		Pbd010315PUBLáfrica
2001.03.15	PUBL	As reclamações de Castelo de Paiva			Pbd010315PUBLreclamaç
2001.03.15	PUBL	Autocarro pode demorar dois meses a ser descoberto	Helena Pereira		Pbd010315PUBLautocarro
2001.03.15	PUBL	Bispos pedem fiscalização eficaz das obras públicas	AM		Pbd010315PUBLbispos
2001.03.15	PUBL	Castelo de Paiva tem metade do poder de compra da média nacional	Lurdes Ferreira		Pbd010315PUBLcastelo
2001.03.15	PUBL	Chegou a hora de cuidar dos vivos	Rui Baptista		Pbd010315PUBLchegou
2001.03.15	PUBL	Durão iiba governos PSD	[Helena Pereira]		Pbd010315PUBLdurão
2001.03.15	PUBL	Estamos aqui esquecidinhos	[Rui Baptista]		Pbd010315PUBLestamos
2001.03.15	PUBL	Estamos aqui esquecidinhos (Editorial)	José Manuel Fernandes		Pbd010315PUBLestamosa
2001.03.15	PUBL	Estradas e pontes para acabar com o isolamento	RB		Pbd010315PUBLestradas
2001.03.15	PUBL	Faltou vontade política	[Rui Baptista]		Pbd010315PUBLfaltou
2001.03.15	PUBL	Gestão de obras-de-arte*, o sistema ficou no papel	Teresa Firmino		Pbd010315PUBLgestão
2001.03.15	PUBL	Jornal da Noite lidera audiências	SR		Pbd010315PUBLjornal
2001.03.15	PUBL	Mais três demissões	AV		DN010315PUBLmais

## PÚBLICO

Datas	Fonte	Título da peça (título principal)	Autor	Pag.s	Referência atribuída
2001.03.15	PUBL	Minas do Peão dão lugar a complexo turístico	JA		Pbd010315PUBLminas
2001.03.15	PUBL	O Estado, os piratas e as areias do Douro	José Queirós		Pbd010315PUBLestado
2001.03.15	PUBL	Pecados velhos	José Queirós		Pbd010315PUBLpecados
2001.03.15	PUBL	Retrato			Pbd010315PUBLretrato
2001.03.15	PUBL	Santana Lopes recebeu ameaças de areiros			Pbd010315PUBLsantana
2001.03.15	PUBL	Uma terra de todos e de ninguém	Leonete Botelho		Pbd010315PUBLterra
2001.03.16	PUBL	JAE ignorou dois avisos para reparar fundações da ponte de Entre-...	Pe <sup>d<sup>ro</sup></sup> Gracias; Ter <sup>esa</sup> Firmino	Internet	DN010316PUBLjae
2001.03.16	PUBL	Ponte estava fundada em zona instável	Teresa Firmino		Pbd010316PUBLponte
2001.03.16	PUBL	Remediações na ex-JAE	IGS		Pbd010316PUBLremodelaç
2001.03.16	PUBL	Segurança e extração de areias na defesa da nova ponte	Eduardo Dâmaso		Pbd010316PUBLsegurança
2001.03.16	PUBL	Veículos podem estar "escondidos" em fundões			Pbd010316PUBLveiculos
2001.03.17	PUBL	Causas da queda da ponte serão divulgadas para a semana	Leonete Botelho		Pbd010317PUBLcausas
2001.03.17	PUBL	Durão Barroso pediu aos dirigentes p/ não fazerem aproveitamento...	Helena Pereira	Internet	DN010317PUBLdurao
2001.03.17	PUBL	Durão exigiu silêncio no acidente da ponte	Helena Pereira		Pbd010317PUBLdurão
2001.03.18	PUBL	Tímido alerta ao ministério nas cartas de Teixeira	Nuno Sá Lourenço		Pbd010318PUBLtímido
2001.05.03	PUBL	Vídeo da Ponte de Entre-os-Rios desapareceu da JAE	E.L.	Internet	DN010503PUBLvídeo
2001.06.13	PUBL	Ex-presidente da JAE não se lembra	Inês Escobar de Lima		Pbd010613PUBLjae
2001.06.20	PUBL	Apareceu a última viatura do desastre de Entre-os-Rios	RuiBaptista; CesaltinaPinto	25	DN010620PUBLapareceu
2001.07.19	PUBL	Volte-face socialista na comissão de inquérito ao desastre de Entre...	Isabel Braga		DN010719PUBLvolteface

**APPENDIX B**

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LIST OF SOURCE ARTICLES FROM "ESPRESSO"

## EXPRESSO

Datas	Fonte	Título da peça (título principal)	Autor	Pag.s	Referência atribuída
2001.03.10	EXPR	57 vítimas	caixa : listagem	10	EX010310EXPcinquent
2001.03.10	EXPR	A doença após o trauma	Nelson Soares	10	EX010310EXPdoença
2001.03.10	EXPR	A hora dos ajudantes	Sofia Rainho	6	EX010310EXPhora
2001.03.10	EXPR	A tragédia dia-a-dia	coluna lateral	8	EX010310EXPtragédia
2001.03.10	EXPR	Acreditar nos portugueses (Cem por cento)	Nicolau Santos	3 Econ <sup>a</sup>	EX010310EXPacreditar
2001.03.10	EXPR	Altos ... & Baixos	José António Lima	5	EX010310EXPaltos
2001.03.10	EXPR	As outras culpas (A máquina da verdade)	Henrique Monteiro	11	EX010310EXPasoutras
2001.03.10	EXPR	Castelo de Paiva não tem protecção civil municipal	Valentina Marcelino e col.	5	EX010310EXPcastelo
2001.03.10	EXPR	Causas movediças na queda da ponte	Pedro Almeida Vieira	7	EX010310EXPcausas
2001.03.10	EXPR	Chegou a vez dos tribunais	Ana Isabel Abrunhosa	9	EX010310EXPchegou
2001.03.10	EXPR	Ciência não explica viagem dos corpos	Margarida Cardoso	32	EX010310EXPciência
2001.03.10	EXPR	De quem foi a culpa? (Expresso Opinião : Editorial)		22	EX010310EXPdequem
2001.03.10	EXPR	Estado e responsabilidade política (Roda Livre)	Manuel Alegre	24	EX010310EXPestado
2001.03.10	EXPR	Exemplos de fora	CM;DR;EG;JA;VL	9	EX010310EXPexemplos
2001.03.10	EXPR	Frases	caixa lateral	23	EX010310EXPfrases
2001.03.10	EXPR	Governabilidade: Bloqueio da Esquerda (Roda Livre)	João Amaral	24	EX010310EXPgovernabil
2001.03.10	EXPR	Guterres à deriva	Cristina Figueiredo	4	EX010310EXPguterres
2001.03.10	EXPR	Homem de gabinete	António Marinho	6	EX010310EXPhomem
2001.03.10	EXPR	Indemnizações em marcha	Anal <sup>be</sup> Abrunh <sup>a</sup> , Nelson <sup>S</sup> <sup>res</sup>	11	EX010310EXPindemnizaç

## EXPRESSO

Datas	Fonte	Título da peça (título principal)	Autor	Pag.s	Referência atribuída
2001.03.10	EXPR	Mãos à obra Portugal	Vitor S. Andrade	1 Imob°	EX010310EXPmãos
2001.03.10	EXPR	O crepúsculo do Guterrismo (Página dois)	Fernando Madrinha	2	EX010310EXPcrepúsculo
2001.03.10	EXPR	O fio dos dias	M <sup>a</sup> . João Avillez	23	EX010310EXPofio
2001.03.10	EXPR	O Grande Carnaval (De pé atrás)	Alfredo Barroso	23	EX010310EXPgrande
2001.03.10	EXPR	O nosso Gestor de Falências (Olho Vivo)	Manuel Monteiro	23	EX010310EXPonosso
2001.03.10	EXPR	O Porto aqui tão perto	Jorge Massada	8	EX010310EXPporto
2001.03.10	EXPR	O rosto da tragédia	Jorge Massada	6	EX010310EXProsto
2001.03.10	EXPR	Os nomes da remodelação	SR	6	EX010310EXPnomes
2001.03.10	EXPR	Portugueses colados à TV	MC		EX010310EXPportugueses
2001.03.10	EXPR	Psicólogos vão ficar vários meses em Castelo de Paiva		1	EX010310EXPpsicólogos
2001.03.10	EXPR	Questão de Estado (Antes de tempo)	João Carlos Espada	22	EX010310EXPquestão
2001.03.10	EXPR	Relatório de 1994 já detectou falhas nas inspecções	Pedro Almeida Vieira	4 e 5	EX010310EXPrelatório
2001.03.10	EXPR	Um gesto teatral e gratuito (Política à portuguesa)	José António Saraiva	3	EX010310EXPgesto
2001.03.10	EXPR	Um inverno como não há memória	António Henriques	11	EX010310EXPinverno
2001.03.10	EXPR	Um pequeno passo (Página dois)	Fernando Madrinha	2	EX010310EXPpequeno
2001.03.10	EXPR	Um sistema dois países (Página dois)	Fernando Madrinha	2	EX010310EXPsistema
2001.03.17	EXPR	"Crimes rodoviários" continuam impunes	Valentina Marcelino	9	EX010317EXPcrimes
2001.03.17	EXPR	A lógica da superfície (A máquina da verdade)	Henrique Monteiro	13	EX010317EXPalógica
2001.03.17	EXPR	A morte passou-lhes ao lado	Ana Paula Azevedo e col	22-30 R <sup>sta</sup>	EX010317EXPmorte

## EXPRESSO

Datas	Fonte	Título da peça (título principal)	Autor	Pag.s	Referência atribuída
2001.03.17	EXPR	A reboque ( <i>Página Dois</i> )	Fernando Madrinha	2	EX010317EXPreboque
2001.03.17	EXPR	Altos ... & Baixos	José António Lima	5	EX010317EXPaltos
2001.03.17	EXPR	Areias do Douro sem controlo	Pedro Almeida Vieira	9	EX010317EXPareias
2001.03.17	EXPR	Buscas centradas em 20 locais	Pedro Almeida Vieira	7	EX010317EXPbuscas
2001.03.17	EXPR	Buscas sem fim	caixa lateral	10	EX010317EXPbuscas
2001.03.17	EXPR	Conservar é poupar	Helder C. Martins	10	EX010317EXPconservar
2001.03.17	EXPR	Dos rios para as estradas	Pedro Almeida Vieira	8	EX010317EXPdosrios
2001.03.17	EXPR	Filme da SIC agitou PSD	Jorge Massada c/ col.	8	EX010317EXPfilme
2001.03.17	EXPR	Lições caídas em saco roto	M <sup>a</sup> Luísa Rolim	6 e 7	EX010317EXPlições
2001.03.17	EXPR	TV fizeram 6,5 dias de emissão	Catarina Nunes	10	EX010317EXPtv
2001.03.17	EXPR	Zangam-se as comadres ( <i>Página Dois</i> )	Fernando Madrinha	2	EX010317EXPzangam
2001.10.05	EXPR	Familiares aguardam últimos pagamentos	Margarida Cardoso+colab.	R <sup>sta</sup>	DN011005EXPfamiliares
2001.12.29	EXPR	Entre-os-Rios : Acontecimento Nacional do Ano [2001]	Ricardo Jorge Pinto	53-54 R <sup>sta</sup>	EX011229EXPentreosrios

**APPENDIX C**

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**SAMPLE OF A SOURCE-ARTICLE CARD**

Phd 010310 Publi Sócratesua

Sócrates " não teve nada que ver com nada " afirma o governador do minist  
rio do ambiente

Secundária da Costa [19]

Responsabilidade [8]

Benefícios de factos [40]

Organizações e operações [27]

Deveres de supervisão [35]

Pratos [18]

Responsabilidade [12]

**APPENDIX D**

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SAMPLE OF AN OPEN CONCEPT CARD

N.º 351

# Suaviza de experiências [redolências de ambientes]

A verdade sobre estes que na altura JAE pertencia a Direção de Serviços, parece ter sido mesmo completamente deixada que a criação do IAN dependeu dos DIOS de Ribeira Grande. (a)

Fica-se sem saber se o Sécção 8 trabalhava no IAN ou sem experiência para trabalhar com projetos de outras áreas, através do IAN, mas também pela experiência da SSOD e mais de sete outros no país... (b)

Três. Ambiente de J u seja a ver el o Duros / IAN mas

"Tudo o que se vê e o processo de criação do IAN e da resposta do IAN, mas as experiências da exploração que foram históricas, parecerem, do m. Ambiente" ... Para DIOS de Ribeira Grande  
Nin. Bula "K" mas não !!

**APPENDIX E**

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SAMPLE OF A MEMO CARD



**APPENDIX F**

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**LIST OF THE INITIAL OPEN CODES**

## List of the initial Open Codes

#	Open Coding labels	Conteúdos e comentários
1.	Operação de conservação <i>versus</i> construção de nova ponte	<i>Erro de decisão? Má avaliação?</i>
2.	Aparente segurança desvaloriza obras	<i>Idem + "wishful thinking"?</i>
3.	População e autarquias <i>versus</i> governo central	<i>Relacionado com # 5</i>
4.	Vítimas indeterminadas	<i>Como "medida" da tragédia</i>
5.	Sentimentos colectivos	<i>Relacionado com # 3</i>
6.	Condições/influências da Natureza	<i>Parte de # 11</i>
7.	Causa desconhecida (razão do desmoronamento)	<i>Relacionado com # 11</i>
8.	Responsabilidade: níveis hierárquicos, esferas de competência	<i>Gerais, funcionais, abstractas...</i>
9.	Garantias de segurança	<i>Inclui normas&amp;critérios/Rel.fiscal&amp;prev</i>
10	Erros e acidEeR: consequências	<i>Reflexos a curto prazo</i>
11	Erros e acidEeR: causas	<i>Genéricas, específicas/factuais, calculadas</i>
12	Responsabilização <i>versus</i> desresponsabilização	<i>Na sua relação directa com acidEoR</i>
13	Erros e acidEeR: subsequências	<i>Despoletados mas não efeitos directos</i>
14	Secretismo (info não-pública)	<i>Comunicação que não se faz</i>
15	Falta de informações	<i>Imediatamente após o desastre</i>
16	Inesperado, sem indícios	<i>O oposto de #25</i>
17	Comunicação pública	<i>Visando obter #19 e #20 (contradições)</i>
18	Prazos: antes e depois do acidEoR	<i>Datas precisas, cronologias, calendários</i>
19	«Sacudir a água do capote»	<i>Quem está na esfera de responsabilização</i>
20	«Salvar a face»	<i>Quem se sente publicamente exposto...</i>
21	Erros e acidEoR: solução das consequências	<i>Provisórias: curto e médio prazos</i>
22	Fluxo de comunicação / informação	<i>Antes do desastre (tb alertas?)</i>
23	Erros e acidEoR: soluções preventivas	<i>Relac. c/ #9 e #32. Incl. normas futuras</i>
24	Resgate dos corpos	<i>Reflexos de outros itens mas num pos-acid.</i>
25	Alertas prévios	<i>O oposto de #16</i>
26	"Timings"	<i>Ritmos de tempo, cadências + ou - lentas</i>
27	Organizações / Organismos envolvidos	<i>Qual a organização por trás do organismo?</i>
28	Extracção de areias: condições influências do Homem	<i>Tem a ver com #11</i>
29	Resultados contrários ao previsto	<i>Tem exs a níveis muito diferentes!</i>
30	Exercício de cargos técn. <sup>os</sup> /espec. <sup>oos</sup> por pess. <sup>as</sup> de perfil político	
31	Furar as regras	<i>Normas existem mas prática descarta-as</i>
32	Fiscalização	<i>Incl. entidades, orgânicas, procedimentos</i>
33	"Wishful thinking"	
34	Isolamento	<i>Parece causa remota para acidEoR</i>
35	Diluição de competências / Indefinição de atribuições	<i>Em #27</i>
36	Formalização teórica <i>versus</i> prática informal (nos 2 sentidos)	<i>É furar regras MAS tb inovar, flexibilizar</i>
37	Apuramento, análise pericial das causas	<i>Inquirição entre causas e responsabilização</i>
38	Exemplos similares: comparação de situações	<i>Inclui vários níveis</i>
39	Negligência ; corrupção ; incompetência	<i>Decisão errada e/ou omissão</i>
40	Conjugação de factores	
41	Brechas	<i>Interrupção de continuidades</i>

**APPENDIX G**

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FACTS FROM ROADS AND BRIDGES' DOMAIN

## Facts from Roads and Bridges' domain

**1983** – Regulamento de Segurança e Acções para estruturas de Edifícios e Pontes  
(DL 253/83, 31 de Maio)

Não impõe parâmetros temporais de fiscalização nem sanções para o incumprimento das normas de conservação e segurança.. [omissão legislativa]

EX010310EXPchegou 41/2

[**1993** – Dos 4 000 efectivos, 1700 quadros dos quais 19 na conservação de pontes – à data do despacho do Presidente da JAE para construção de nova ponte...]

Pbd010308PUBLhá falta 27/2v

**1994** – Inspecção Geral das Obras Públicas e Transportes-IGOPT inspeciona a Direcção de Serviços de Pontes. (Ministro da tutela *Ferreira do Amaral*)

- Aponta graves deficiências na fiscalização às estruturas fluviais.
- Salaria a não-actualização dos cadastros das pontes.
- Entre vários outros aspectos, a JAE não tinha ainda procedido à definição de normas de conservação e de inspecção periódica de pontes, pontões e viadutos. O Regulamento existente não define periodicidade para as inspecções (quando normas internacionais apontam rotinas de 15 meses e rigorosas de 5 anos)
- Relatórios de Actividades da JAE revelam falhas nas inspecções

EX010310EXPrelatório 32/5v

**1997/8 ?** – TC detecta irregularidades (Sindicância à JAE pelo governo PS - pedida pelo ministro J. Cravinho ; inquérito político, segundo PSD). Suspeita de corrupção.

**1998** - Sindicância à JAE. Relatório salienta imperiosidade de "inventário exaustivo das necessidades de conservação das obras, perspectivar os custos de reparação de cada uma delas e calendarizar as acções inspectivas, definindo o seu grau de prioridade".

EX010310EXPrelatório 32/5v

Identifica "insuficiência de meios humanos (8 elementos), má preparação técnica com repercussões nas deficiências de funcionamento ao nível do desenho e reprografia e a quase inexistência de meios técnicos".

EX010310EXPrelatório 41/2

[1998 – A Divisão de Conservação de Pontes (na Direcção de Serviço de Pontes?) já tem "sangria de pessoas"]. Situação vem da JAE desmantelada ; a própria JAE não tinha operacionalidade quando ainda estava viva. Técnicos não saíam da secretária porque não pagavam estadias nem deslocações.

Testemunhos de pessoas dos serviços JAE em:

Pbd010314PUBLiep 27/4v

Testemunhos do Presidente do IEP em:

Pbd010308PUBLhá falta 27/2v

1998, **Junho** – JAE lança concurso público internacional para cumprir parte das recomendações (e também como forma de suprir falta de recursos internos) para criar um Sistema de gestão de Obras de arte da rede rodoviária nacional.

- » primeiro seria adquirido um sistema informático
- » foram escolhidos 4 distritos (Braga, Aveiro, Santarém, Évora)
- » os concorrentes (empresas/consórcios) deveriam fazer os levantamentos para a base de dados em 600 dias
- » sistema deveria ter capacidade para seleccionar obras prioritárias (vistoria e manutenção) e estimar custos.
- » concorrente vencedor forneceria também um "Manual de Procedimentos de Inspecção de Pontes" para estabelecer os procedimentos a seguir nesta matéria.

("Nunca houve na JAE um Manual com regras de inspecção")

Pbd010314PUBLiep 27/4v ; Pbd010315PUBLgestão 32/4

Sangria de quadros inviabiliza, projecto não passa do papel.

Pbd010314PUBLiep 41/1v

1999 – JAE publica classificação dos concorrentes, mas...  
... já não há adjudicação

1999 – Extinção e desmantelamento da JAE ; Reestruturação organizacional (que muitos apontam como causa de uma diminuição de acompanhamento das estruturas mais antigas ...)  
Pbd010306PUBLfalta 32/1v

### TUTELA NA QUESTÃO DAS PONTES

Até 1999

Ministério do Equipamento Social → JAE (a) → Direcção de Serviço de Pontes

1999

Extinção da JAE e criação de 3 Institutos  
Ministério do Equipamento Social → Secretaria estado Obras Públicas → IEP

Administração sob a égide do IEP:

- IEP (1) – Instituto das Estradas de Portugal
- ICERR (2) – Instituto para Conservação e Exploração da Rede Rodoviária
- ICOR - Instituto para a Construção Rodoviária

(a) Presidente – Mário Fernandes

Presidência (1) António Martins <sup>☒</sup>; Vice-Presidência (2) Vítor Baptista  
<sup>☒</sup> Principal responsável técnico do sector

- Ao novo ICERR caberia a tarefa da anterior Direcção de Serviços de Pontes da JAE.  
*Um dos objectivos era de segurar bons engenheiros...teve resultado contrário ao previsto!!! Saídas e reformas...  
Em consequência disto verificou-se a entrada de jovens quadros partidários (não-especialistas) directamente para lugares de chefia...*

Pbd010306PUBLinvção 29/1

- 1999.09.22 – Circular do IEP : atribuição de responsabilidade das pontes endossada ao ICOR.  
Pbd010315PUBLmais 8/4v
- No entanto prática subverteu esse preceito, pelo menos na ponte de EoR...: o técnico que efectuou vistoria à ponte foi enviado pelo ICERR !

Pbd010307PUBLconservaç 31/1v

Notas :

- Na Administração dos 3 institutos só 3 engenheiros civis...
- Cravinho – sem autorização da AR – outorga em diploma (Decreto-Lei) dispensa de vistos do Tribunal de Contas aos 3 institutos que sucederam à JAE.

Pbd010310PUBLtribunal 32/2v

Observações:

>>Dúvida de competências: ICOR-só projectos de novas vias? ICERR-manutenção das 3000 obras-de-arte existentes no País... João Cravinho (à altura Ministro do Equipamento Social) e promotor da reorganização refuta qualquer “vazio de competências em matéria de estradas”. Novos Institutos são sucedâneos na integralidade da JAE, com todos os meios para continuar a fazer a vistoria das pontes.

Pbd010306PUBLfalta 27/1v

>>Relativamente à complexidade legal dos 3 institutos: estrutura exclusivamente empresarial ou de índole administrativa?

Pbd010310PUBLtribunal 27/4

IEP nunca vistoriou as fundações. Segundo o Presidente do IEP, por inexistência de técnicos e meios, fiscalizam-se as estradas pelo seu “aspecto” partindo do pressuposto que há indícios detectáveis pelos técnicos que apontem falta de segurança.”Avaliação das fundações é tecnicamente muito complicada...” *Pbd010308PUBLnenhuma* 32/2

**2001** - À data do desastre o sistema de inspecção de pontes do IEP e seus institutos associados (ICERR e ICOR) mantém-se uma incógnita. *EX010310EXPrelatório* 32/6

Não existem :

- Base de dados que mantenha registo actualizado das obras-de-arte em Portugal (logo, possibilidade de avaliar o seu estado de conservação);
- Também deveria haver (mas não existia) plano sistemático de inspecção de pontes. Em pontes antigas (como a de EoR, com 116 anos) os efeitos das cheias nas estruturas precisam de ser acompanhados;
- Para além de não existir prioritização, também não há dados precisos relativos à percentagem de renovação relativamente ao valor total da construção.

*EX010317EXPconservar* 22/1

**2001** – Depois do desastre o Ministério do Equipamento Social afirma ir pôr em marcha plano de fiscalização de todas as pontes.

**APPENDIX H**

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FACTS FROM HINTZE RIBEIRO BRIDGE

## Facts from Hintze Ribeiro Bridge

**1883** – Memória descritiva do projecto da ponte na “Revista das Obras Públicas e Minas”  
(opções técnicas)

Ponte tem 116 anos à data do desastre

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**1986, 16 e 17 de Dezembro** – Realização de inspecção pedida pela JAE para estudar possível reforço e alargamento da ponte. No âmbito dessa vistoria foi produzido o vídeo (mais tarde exibido na Sic) de uma avaliação aos pilares da ponte efectuada (com mergulhadores) pela empresa ETEC-Escritório Técnico de Engenharia Civil.

Pbd010315PUBLverdade 32/4

**1986, 29 de Dezembro** – Recomendações à JAE : ETEC ( empresa de sondagens) envia o seu Relatório Técnico à JAE – na sequência da fiscalização solicitada – no qual apresenta sugestões para reparação dos pilares.

As recomendações de reparação aí constantes são abandonadas, por se pensar construir uma nova ponte “por pressão dos autarcas locais”

Pbd010315PUBLverdade 40/2

**1990** – 1º projecto da nova ponte : “chumbado”

**1990, Julho/Agosto** – JAE decretou encerramento por 30 dias, por degradação do tabuleiro. Obras de beneficiação (só do tabuleiro, não das fundações/pilares) ; melhoramentos na estrutura metálica e pavimentos.

**1993** – Recomendações à JAE : Relatório da empresa ETEC propõe nova ponte e manutenção da ponte antiga para passeio pedonal (e/ou viaturas ligeiras). Tecnicamente não havia evidência de iminência de acidente.

Pbd010316PUBLjae 32/4v

1993 – Despacho do Presidente da JAE (Mário Fernandes) autorizando a construção de uma nova ponte em Entre-os-Rios. => Concurso “por razões de urgência”.

*(Na Comissão de Inquérito Parlamentar informa não ter dado atenção particular a este processo e reconhece que 4 anos (recomendações de 1989 e concurso de 93) é muito tempo).*

Pbd010313PUBLexpresid 26/4

**1994** – data em que PSD (partido então no governo) diz ter lançado projecto de nova construção

Mudança de governo ...

**1998** – novo projecto da nova ponte : só pronto nesta data  
(inserido num troço de via a air do IP5)

1998, **Maio** – última inspecção da JAE ; não havia indícios de anomalias – nos tabuleiros, nos pilares, nos encostos.

(Semanário “Expresso” não obtém respostas às perguntas relativas aos pormenores técnicos desta inspecção).

1998, **5 Novembro** – carta do Presidente da Câmara de Castelo de Paiva a várias entidades...

1998/1999 ? – Ponte recebeu reparação técnica?

2000 – Empresa “Águas Douro e Paiva” analisa alternativas para passagem de uma conduta de água. Especialista da Univ. do Porto faz uma vistoria à Ponte HR com esse fim. Tratou-se de uma verificação visual (pilares fora de água). Registou que o tabuleiro metálico estava em muito mau estado mas que os pilares estavam em bom estado.

Pbd010306PUBLponte 25/1v

2000, **Setembro** – carta de um cidadão (AJS) ao Ministro das Obras Públicas alertando para a retirada das areias do Douro que poderão minar a segurança da ponte...

2000, **Dezembro** – vistoria técnica (Direcção das Estradas do Porto)

Surge Relatório com recomendações relativamente ao pilares e problemas potenciados por areias (embora chamasse a atenção para outro pilar e para um problema de excesso de areia)

Pbd010306PUBLdirecção 39/1v

Há “despacho (do Presidente do IEP?) para enviar já de seguida” em Fax à Direcção Regional do Ambiente-Delegação Norte (DRAN), organismo que depois poderia executar as recomendações [tutela das margens do ponto de vista ambiental].

Entretanto Director das Estradas do Porto aposentou-se => o despacho urgente fica aparentemente sem execução...

Ninguém sabe porque razão – apesar dos despachos nesse sentido – o relatório não foi enviado... Os procedimentos que dariam origem a uma sequência de intervenções foram interrompidos sem que se possa explicar cabalmente a razão.

Pbd010306PUBLponte 27/3v ; Pbd010310PUBLinstituto 32/2v

2001, **Janeiro** (2 meses antes do desastre) – Técnico do ICERR faz vistoria “acima do leito do rio” (=à superfície) para hipótese de conduta de água. Segundo os indicadores à disposição dos técnicos, não se verificava qualquer desvio dos marcadores...[*não apontou problemas nos apoios dos tabuleiros*] Relatório ??? Os técnicos têm marcadores ... não se verificava qualquer desvio nesses marcadores.

Pbd010306PUBLvisita 16/1

2001, **17 de Janeiro** – Secretário de Estado das Obras Públicas (Luís Parreirão) diz ao Presidente da Câmara de Castelo de Paiva que a construção da nova ponte ainda iria esperar mais alguns anos!

2001, **18 de Janeiro** – Secretário de Estado das Obras Públicas (Luís Parreirão) em reunião com IEP e autarcas de Penafiel e Castelo de Paiva afirma que lançamento do concurso para nova ponte será ainda no primeiro trimestre de 2001!

2001, **5 de Março** – ponte Hintze Ribeiro cai.

NOTA: a construção da nova ponte tinha inscritas verbas em PIDDAC em 2001, 2002 e 2003...

Pbd010305PUBLponte 1/1

**APPENDIX I**

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FACTS FROM DOURO RIVER DOMAIN

## Facts from Douro River domain

**1993** – Competências da DRAN-Direcção Regional de Ambiente do Norte [Ministério do Ambiente];

e

**1994** – Lei de “Utilização do domínio hídrico”;

são base para que a DRAN [MA] inclua fiscalização de inertes nas bacias dos rios nortenhos, cabendo-lhe:

- “efectuar reconhecimentos regulares sobre o estado da rede hidrográfica e nas zonas costeiras, nomeadamente quanto a transporte de sólidos, degradação das margens e leitos de cheias”
- “assegurar o inventário e cadastro permanente das utilizações do domínio hídrico”

Ex010317EXPareias 35/1v

**De 1994 a 1997** - Gestão geral dos recursos hídricos cabe ao Ministério do Ambiente

- Concessão / Licenciamento : DRAN [MA]  
Concedia, em hasta pública, lotes para exploração
- Fiscalização : Capitania do Douro [?Secrª. Estado da Administração Portuária-ME]  
*Não havia regras, tudo à balda; gritante debilidade; contrato impunha restrições mas areeiros contornavam-nas facilmente*  
Pbd010306PUBLcadaum 28/1

**1997, Junho** – Criação do IND-Instituto de Navegabilidade do Douro para superintender o canal navegável do Douro.

Neste caso específico as tutelas passam a ser repartidas pelos Ministérios :

- do Equipamento-ME (a)
- do Ambiente-MA (b)
- do Planeamento-MP (c)

mas em que (b) e (c) são órgãos consultivos na direcção do IND.

Surge regime de excepção à gestão geral dos recursos hídricos nacionais que, por legislação de 1994, cabe ao Ministério do Ambiente.

[*Segundo o ministro J. Sócrates – MA*] com a criação do IND, as taxas de extracção cobradas aos areeiros foram transferidas da DRAN [MA] para o IND.

As competências executivas do IND apenas se circunscrevem à zona navegável (a parte mais profunda do rio, utilizada pelos barcos), isto é, segundo as suas competências legais, o IND apenas deveria dar parecer sobre “os actos que, incidindo na via navegável, possam interferir com a navegabilidade”.

Relativamente ao Douro, o MA manteve a tutela sobre as margens do rio.

No caso do licenciamento dos areeiros - que deveriam ser passados pela DRAN [MA] – o parecer do IND nem sequer é vinculativo.

No entanto, o IND passou a ser entidade emitente das licenças dos areeiros, ainda que sem qualquer norma legal.

Ex010317EXPareias 35/1v; 2

Assim, verificava-se que a extracção das areias do Douro é do âmbito do IND [ME], embora as consequências da exploração em termos hídricos pertencem ao MA.

Pbd010310PUBLsócratesna 35/1

*A concessão de licenças transformou o que se fazia desreguladamente, numa actividade sob regulação.*

Pbd010315PUBLestado 32/3v

1999 – O IND passa a ter tutela exclusiva do Ministério do Equipamento.  
 Ministério do Equipamento Social → Secretaria de Estado da Administração Marítima e Portuária  
 (José Junqueiro) → IND

2001, 5 de Março – Presidente do IND distribui comunicado assegurando que não é efectuada qualquer extracção de inertes na proximidade da ponte de EoR desde Setembro 1997. Extracções em curso são mais de 12 km a jusante. Pbd010306PUBLponte 17/1

No entanto:

Relatório de 1999 do próprio IND refere explorações ilegais. Pbd010313PUBLareeiros 17/3  
 Testemunhos referem que areias continuam a ser tiradas. Pbd010306PUBLfragilidades 17/2

2001, Março – Após o acidente, Presidente do IND (Mário Fernandes) diz que:

- IND [ME] “dá a cara” pela fiscalização das dragagens (\*) mas rejeita responsabilidade exclusiva na fiscalização.

Também cabe fiscalização a:

- DRAN-Direcção Regional de Ambiente e Ordenamento do Território [MA] (\*\*)
- Capitania do Porto do Douro [ME]

(\*) Faz a concessão: a atribuição de lotes não é precedida de qualquer estudo científico sobre o perfil e a ecologia do rio.

Fiscaliza a extracção: “à distância”, por estimativa, com base na capacidade útil dos barcos envolvidos.

Pbd010308PUBLp&r 27/2v ; 32/2v ; Pbd010313PUBLnegocio 32/3

CrITÉrios aplicados:

- hidrométricos (de profundidade = saber qual a diferença entre o fundo do rio e o nível da água.) e não ecológicos (perfil e ecologia do rio)

Métodos:

- controlo à distância, por estimativa, com base na capacidade útil dos barcos envolvidos

Sanções:

- coimas (perda de licença)

Objectivos:

- gerar receitas
- tornar o canal navegável

Nota: segundo Secretário de Estado da Administração Marítima e Portuária [ME], todos os dias há fiscalizações e há relatórios diários. Pbd010313PUBLgovernoneg 32/3

(\*\*) DRAN [MA] ficou com a tutela das margens do ponto de vista ambiental “apenas”...  
 A Direcção de Serviços da Água, por exemplo, insiste que não possuem competências nem na fiscalização, nem no licenciamento e remete para o IND [ME].  
 O MA repudia qualquer competência e sublinha que a fiscalização relativamente à estabilidade das obras públicas compete a quem licencia a realização de trabalhos nesses locais [IND]. DN010315PUBLtomada 32/4v

*Exemplo de uma situação no âmbito da fiscalização:  
 empresário a quem seja apesado um barco, pode ficar “fiel depositário” do mesmo (não é da competência do IND, a DRAN não tem condições e a Capitania não quer assumir a responsabilidade...)*

## Procedimentos, Normas

**1994** – Para esta data, previsto Plano para garantir “a segurança de obras marginais ou de transposição de leitos”

Na falta destes Planos, existe uma Norma do Ministério do Ambiente. Refere que a extracção de inertes “só deve ser autorizada quando justificada por razões de ordem técnica, ambiental e paisagística e em locais cujo desassoreamento seja imprescindível”. Além disso a Lei (de “Utilização do domínio hídrico”, 1994) obriga a que a DRAN [MA] realize estudos de impacte ambiental para extracções superiores a 150 mil m<sup>3</sup> por ano.

**NOTA:**

Ministério do Ambiente entende que as extracções são contabilizadas uma-a-uma e não no seu conjunto. Por isso não houve exigência de estudos prévios (e em 2000 foram registados – ainda que estimando-se em 30% os não-registados – cerca de 320 mil m<sup>3</sup>)

Ex010317EXPareias 31/3v

**APPENDIX J**

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**OPEN CODES SYNTHESIS TABLE**

## Open Codes synthesis table

(Nºficha) Open Coding	Tempo ; Termos	Conteúdos: intervenientes e acções	Novo(s) "label"
<p>25</p> <p>ALERTAS PRÉVIOS</p> <p>(26-Timings;32-Fiscaliza.)</p>	<p>Antes do acidente</p> <p>Alerias ; denúncias ; avisos ; chamadas de atenção</p>	<p>• locais alertam Governo Central • Imprensa • especialistas em vistorias c/ relatórios</p> <p>Cortes de estrada / Vistorias técnicas com Relatórios / Audiências / Cartas e documentação</p> <p>Obs. – <i>saber se foi ou não violado o dever de diligência; iniciativas tomadas em função dos alertas</i></p> <p>• populares • [especialistas] • [Governo]</p>	<p><b>Novo(s) "label"</b></p> <p><b>Obs.</b> Tem aspectos de "Fiscalização" =&gt; A VER!</p>
<p>2</p> <p>APARENTE SEGURANÇA DESVALORIZA OBRAS</p> <p>(33-"wishful thinking")</p>	<p>Antes do acidente</p>	<p>* "wishful thinking"; "Causas de Erro", etc =&gt;.</p>	<p><b>Obs. ELIMINAR!</b> É um pormenor sem quase ocorrências registadas ; incluído noutros "label" *</p>
<p>37</p> <p>APURAMENTO, ANÁLISE PERICIAL DAS CAUSAS</p> <p>(12-Responsabilização)</p>	<p>Depois do acidente</p> <p>Apurar responsabilidades ; Inquérito ; PROVAS</p>	<p>• Comissões de inquérito: quais (Judicial, parlamentar, do governo), quem as integra</p> <p>=&gt; Níveis:</p> <p>criminal civil político</p>	<p><b>Obs. ELIMINAR!</b> Faz uma ponte entre: - identificação das causas - atribuição das culpas</p>
<p>41</p> <p>BRECHAS</p>	<p>Antes do acidente Tb Após:(falta de coordenação política e das operações...)</p> <p>B. na legislação; malha legal permissiva; não dar seguimento a...; não ter em conta; omissão legislativa; grãos na engrenagem; inexistência de meios; falhas de informação; interrupção de continuidade; falhas entre as decisões/estratégias e sua implementação na prática</p>	<p>• Pessoas por trás: da legislação da coordenação técnica</p> <p>Legislação- inexistente;permissiva / Instituições sem condições / decisões que mudam estratégia e perdem sequência / desmembramento da JAE e abrupto final de concurso internac. / regulamentação [DLei] com falhas / falhas de informação dos institutos governamentais</p>	<p><b>Obs. IMPORTANTE!</b> Verifica-se a vários níveis !!! Articula-se com vários "Factores Humanos" (causas)</p>

<b>(Nºficha) Open Coding</b>	<b>Tempo ; Termos</b>	<b>Conteúdos: intervenientes e acções</b>	<b>Novo(s) "label"</b>
<p><b>7</b></p> <p><b>CAUSA DESCONHECIDA</b> (razões da queda)</p>			<p><b>Obs. ELIMINAR!</b> Quase sem ocorrências, que pertencem às causas (=a outras fichas)</p>
<p>(11-Eros e AeOR:Causas)</p> <p><b>17</b></p> <p><b>COMUNICAÇÃO PÚBLICA</b> (IMP; contraditória; em sentidos opostos?)</p> <p>(14-Secretismo)</p>	<p>Depois do acidente</p> <p>Anúncio; Comunicado; Interpelações na AR; Confª. De imprensa; revelação pública; "briefings", esclarecimentos</p>	<p>• Presidentes dos Institutos • Membros do Governo</p> <p>Preocupação dos responsáveis políticos em "salvar a face" cf. 20 / anúncio de múltiplos projectos para o concelho / Infos contraditórias !</p> <p><b>Comunicação que existe, isto é, que se realiza ! Cf. 14</b></p> <p>• especialistas vários</p>	<p><b>Obs. ELIMINAR!</b> Conceitos que tinham a ver c/ outros temas =&gt; a dispersar !!!</p>
<p><b>6</b></p> <p><b>CONDIÇÕES, INFLUÊNCIAS DA NATUREZA</b></p> <p>(28-Ext. areias; 11;7-Eros e AeOR:Causas)</p>	<p><u>Antes do acidente</u></p> <p>Corrente; vigor, turvas e revoltosas águas; violência do caudal</p>	<p>Conjecturas sobre causas naturais... mas também sobre o «impacte que um certo modelo de desenvolvimento tem na natureza»</p>	<p><b>Obs.</b> <b>REORGANIZAR!!!</b> Causas =&gt; tipologia Dúvida: "rótulo" geral, mas seu especifº - cheias ?</p>
<p><b>40</b></p> <p><b>CONJUGAÇÃO DE FACTORES</b></p> <p>(11-Eros e AeOR:Causas)</p>	<p><u>Antes do acidente</u></p> <p>conjugação; cadeia; factores em simultâneo; associação; contributo; factores antigos flontribuindo diariamente; coincidência de factores anormais; clique que precipita</p>	<p>• da Natureza (cheias) • Humanos (incúria, atropelo de regras) • "Mistos" ? (extracções, barragens a montante) "Cadeia de responsabilidades e inevitabilidades"</p>	<p><b>Obs. IMPORTANTE!</b> <b>REORGANIZAR!!!</b> Causas =&gt; processa/ Inclui fact. Com tempos, origem e natureza diversas. Ver f. 17</p>

<b>(Nºficha) Open Coding</b>	<b>Tempo ; Termos</b>	<b>Conteúdos: intervenientes e acções</b>	<b>Novo(s) "label"</b>
<p><b>35</b> DILUIÇÃO DE COMPETÊNCIAS; INDEFINIÇÃO DE ATRIBUIÇÕES</p> <p>(8-Respons. ade.;27-Organ.)</p>	<p><u>Antes do acidente</u></p> <p>competências: diluídas, não-perceptíveis, transferidas, partilhadas</p>	<p>• JAE: Direção de Serviços de Pontes=&gt; 3 Institutos</p> <p>• ICERR • ICOR • Ministério do Ambiente (&amp; DRAN – Dir. Reg. Amb. Norte) • Ministº Administ. Interna (IND)</p> <p>Diluição de competências resultante de diplomas pouco claros / transferência de poderes incorrecta / complexidade resultante de re-engenharia organizacional / divergência entre "teoria e prática".</p>	<p><b>Novo(s) "label"</b></p> <p><b>Obs. IMPORTANTE!</b> Tem a ver com causas organizacionais + "jogo de empurra" + falta de regulamentação e fiscalização.</p>
<p><b>11</b></p> <p>ERROS E AeOR: CAUSAS (genér. e específicas)</p> <p>(10;13;21-Erros e AeOR... 7-Caus. desc.; 40-Conj. Fact.)</p>	<p><u>Antes do acidente</u></p> <p>causas imediatas, c.remotas; factores que contribuem, precipitam ; conjugação; culpa: tudo junto; originar≠contribuir; cadeia de incúrias</p>	<p><i>Aqui há uma amálgama de:</i></p> <p>Causas: Humanas+Naturais, em tempos ≠s; com pesos diferentes / Responsabilidades: políticas, técnicas, etc (confundidas com causas) / Conjugação de factores (m<sup>tas</sup>) / Reflexão sobre acidentes (em geral e este em particular)</p>	<p><b>Obs. REORGANIZAR!!!</b> Tem que ser interna/ reorganizado + também "alimentar" outros...</p>
<p><b>10</b></p> <p>ERROS E AeOR: CONSEQUÊNCIAS</p> <p>(11;13;21-Erros e AeOR...)</p>	<p><u>Depois do acidente</u></p> <p>prejuizos; danos; "vida ainda mais complicada" ...</p>	<p>Prejuizos no erário público / vítimas / dificuldades acrescidas nas travessias / mais isolamento / ...</p> <p>Reacção relativamente à segurança de infraestruturas...</p>	<p><b>Obs. ELIMINAR?</b></p> <p>- poucas ocorrências registadas</p> <p>- não traz "novo" p/ a temática em estudo ...</p>
<p><b>21</b></p> <p>ERROS E AeOR: SOLUÇÃO DAS CONSEQUÊNCIAS</p> <p>(10;11;13;23-Erros e AeOR)</p>	<p><u>Depois do acidente</u></p>	<p>Soluções a curto e médio prazos =&gt; para minorar as consequências imediatas do desastre</p>	<p><b>Obs. ELIMINAR!</b></p> <p>- poucas ocorrências registadas</p> <p>- não interessa</p>

<b>(Nºficha) Open Coding</b>	<b>Tempo ; Termos</b>	<b>Conteúdos: intervenientes e acções</b>	<b>Novo(s) "label"</b>
<p><b>23</b></p> <p><b>ERROS E AeOR: SOLUÇÕES PREVENTIVAS</b></p> <p>(10;13;21-Erros e AeOR... 9-Garant.Seg.;32-Fiscaliz.)</p>	<p>Depois do acidente</p> <p>no futuro: vistorias, rotinas de inspecção/manutenção; plano sistemático; recomendações; plano de fiscalização</p>	<p>• Políticos • Comissão de inquérito do Governo</p> <p>• Especialistas</p> <p>Referência a medidas de prevenção para o futuro (isto é, os elementos que na realidade faltaram quando do acidente) ... para «oferecer às pessoas uma ideia de segurança e estabilidade»</p> <p>Por OMISSÃO: causas também ?</p>	<p><b>Obs.</b></p> <p>RE-ORIENTAR registos para: Fiscalização, Garantias de segurança, causas...</p>
<p><b>13</b></p> <p><b>ERROS E AeOR: SUBSEQUÊNCIAS</b></p> <p>(10-Consq.; 11-Causas)</p>	<p>Depois do acidente</p> <p>demissão; fiscalização; pressão sobre o Governo</p>	<p>• Políticos • Governo</p> <p>Inquérito / Enfoque nas estruturas semelhantes / "abanão" político / demissões também técnicas / projectos para combater isolamento do concelho / fiscalizações: alteração?</p>	<p><b>Obs.</b></p> <p>RE-ORIENTAR registos para: Isolamento, Responsabilização, ...</p>
<p><b>38</b></p> <p><b>EXEMPLOS SIMILARES</b></p> <p>comparação de situações</p>	<p>Antes do acidente e Depois do acidente</p> <p>["Benchmarking"]</p>	<p>A níveis diversos:</p> <p>queda de pontes em Portugal e estrangeiro / obras públicas portuguesas: irresponsabilidade e impunidade / políticos estrangeiros: assumir ou não a responsabilidade / desastres em Portugal que não serviram de lição / associação de causas naturais e humanas em Portugal.</p>	<p><b>Obs. ELIMINAR?</b></p>
<p><b>30</b></p> <p><b>EXERCÍCIO DE CARGOS TÉCNICOS E FUNÇÕES ESPECIALIZADAS POR PESSOAS DE PERFIL POLÍTICO</b></p> <p>(8-Resp.;9-Resul.con.Prev.)</p>	<p>Antes do acidente (mas hoje tb ...)</p>	<p>Ingresso directo de jovens quadros de partido em lugares de chefia.</p>	<p><b>Obs. ELIMINAR ?</b></p> <p>RE-ORIENTAR para outros rótulos ? Poucas ref.ªs mas parece importante ...</p>

<b>(Nºficha) Open Coding</b>	<b>Tempo ; Termos</b>	<b>Conteúdos: intervenientes e acções</b>	<b>Novo(s) "label"</b>
<p><b>28</b></p> <p><b>EXTRACÇÃO DE AREIAS:</b> Condições/influências do Homem (6-Cond Infi Natureza 7-Causa desc; 11-... causas)</p>	<p><u>Antes</u> do acidente</p>	<p>Múltiplos dados referentes a indefinição de atribuições, tornar regulamentação, fiscalização, corrupção, etc</p>	<p><b>Obs.</b> <b>RE-ORGANIZAR</b> Faz parte da tipologia das causas especificas em "Factores Mistos"</p>
<p><b>15</b></p> <p><b>FALTA DE INFORMAÇÕES</b> (22-Fluxo comun. Info.)</p>	<p><u>Depois</u> do acidente (imediate/ após)</p>	<p>Desconhecimentos de vária natureza, logo depois do acidente... Fruto de <input type="checkbox"/>és-organização, etc [Nota: estes registos não têm a ver com "secretismo" que tem entrada própria + menções em "Responsabilização", etc]</p>	<p><b>Obs. ELIMINAR!</b> -não apresenta quase ocorrências... -não é relevante...</p>
<p><b>32</b></p> <p><b>FISCALIZAÇÃO</b> (9-Garant. Segurança)</p>	<p><u>Antes</u> do acidente</p> <p>vistoria; controlo, inspecção; vigilância; supervisão; sindicância. Tb: rotinas, planos, mecanismos. Tb: recomendações, relatórios, regulamentações, manuais</p>	<p>Diversos níveis e incidências!! Quanto a : - <i>objecto</i>: extração de areias, segurança de pontes, organismos / entidades responsáveis - <i>natureza</i>: insuficiente, omissa (inexistente) - <i>tempo</i>: passada (investig.causas) / futura (garantias de segurança)</p>	<p><b>Obs. IMPORTANTE!</b> A desdobrar: Regulamentação e Fiscalização [retirar tb registos de "Alertas"]</p>
<p><b>22</b></p> <p><b>FLUXO DE COMUNICAÇÃO / INFORMAÇÃO</b> (19-Sacudir água 20-salv. Face; 15-falta infos)</p>	<p><u>Antes</u> do acidente</p> <p>informação; relações entre; não-aviso de alerta; interrompidas; desconhecimento; base de dados / inventariação; inexistência de dados precisos</p>	<p>Seg. governo não houve alerta das entidades competentes (locais e centrais) / articulação entre pessoas-funções prejudicada por razões pessoais <u>ver f. 7</u> / Silêncio do IEP / desconhecimentos vários: nº exacto de obras-de-arte e seu estado, análise de custos renovações/construção, alterações constantes pela transição de trechos de vias (EN) de Gov. Central para Câmaras Municipais.</p>	<p><b>Obs. MANTER?</b> Provavelmente mas com articulação e/ou alimentação de outras... [alertas ; organizações e brechas...]</p>

<b>(Nºficha) Open Coding</b>	<b>Tempo ; Termos</b>	<b>Conteúdos: intervenientes e acções</b>	<b>Novo(s) "label"</b>
<p><b>36</b></p> <p><b>FORMALIZAÇÃO TEÓRICA versus PRÁTICA INFORMAL</b></p> <p><i>Existe nos 2 sentidos!</i> A =&gt; B ; A &lt;= B</p>	<p>Depois do acidente</p> <p>desburocratizar; [depois da confusão, novas regras], acelerar, minimizar tempo, medidas que facilitem [proceder ao contrário do método normal]</p>	<p>• Governo</p> <p>Desburocratizar concursos, acelerar processos / equipas multidisciplinares (INOVAÇÃO) para levantamento das situações em emergência / dispensa de abertura de concursos públicos</p> <p><i>Paradoxo- em Espanha: afastada juíza por excesso de burocracia &amp; também lentidão para ser cumpridas normas legais...</i></p>	<p><b>Obs. MODIFICAR? DESDOBRAR?</b></p> <p>- "furar" regras</p> <p>- aspectos de inovação</p> <p>- tb altera os timings</p>
<p><b>31 a</b></p> <p><b>FURAR REGRAS</b></p> <p>(32-Fiscal.;Regulament.)</p>	<p>a) <u>Antes</u> do acidente ...</p> <p>Fiscalização; corrupção; irregularidades; "prática subverte preceito normalizado"; atropelar, torpedear regras; contornar restrições impostas</p>	<p>• Dir. Reg. Ambiente do Norte • IND • IEP: formalmente ICOR e na prática ICERR</p> <p>Em vários campos e por vários intervenientes: para além da confusão de poderes (IND/DRAN) verifica-se emissão de licenciamentos sem atribuição por norma legal...</p> <p>- extração de areias ("técnica" das 2 sociedades; área de utilização maior que a de exploração)</p> <p>- entidade fiscalizadora das areias (método de contagem – unitária – contorna estudo de impacte ambiental)</p> <p>- fiscalização de pontes</p> <p><i>Depois:</i> • MAI &amp; Câmara de Castelo de Paiva</p>	<p><b>Obs. IMPORTANTE!</b></p> <p>Verifica-se em sectores diferentes e a múltiplos níveis !</p>
<p><b>31 b</b></p> <p><b>FURAR REGRAS</b></p>	<p>4) ... Depois do acidente</p> <p><i>idem</i></p>	<p>Desburocratizar para reverter isolamento acrescido (D/Lei) dispensa fiscalização prévia do Tribunal de Contas (Câmara "liberta" dos limites previstos na lei das finanças locais)</p> <p>(Tb mergulhadores e limites máximos de segurança...)</p>	<p><b>Obs.</b></p>
<p><b>9</b></p> <p><b>GARANTIAS DE SEGURANÇA</b></p> <p>(23-Sol.Prev.; 32-Fiscal.)</p>	<p><u>Antes</u> do acidente ...</p> <p><u>Depois</u> do acidente</p> <p>intemporalmente</p> <p>Afiandar bom estado; garantir fiabilidade; verificação metódica; Sentimentos de inquietação e insegurança</p> <p><i>Componente "obrigatória" do quotidiano (Direito das pessoas ; Dever do Estado)</i></p>	<p>• Governo ; Estado</p> <p>• Ministério Equipamento Social ..... (pontes) (areias)</p> <p>• IND</p> <p>1) em geral dever do estado p/ com os cidadãos</p> <p>2) especificamente responsabilidade civil extra-contratual: segurança e prevenção das vias públicas</p> <p>3) pressupostos de (2) : <i>sistemática</i>/ (plano de segurança / obras de manutenção, vistorias) / a pedido (análise estrutural)</p> <p>4) <i>Realidade</i>: desproporção entre meios e necessidades</p>	<p><b>Obs. ELIMINAR ?</b></p> <p>Interessará para compreensão do caso?</p>

<b>(Nºficha) Open Coding</b>	<b>Tempo ; Termos</b>	<b>Conteúdos: intervenientes e acções</b>	<b>Novo(s) "label"</b>
<p><b>16</b></p> <p><b>INESPERADO</b> (Sem Indícios)</p> <p>(32-Fiscalização 25-Alertas;39-Incompét.)</p>	<p>Fenómeno brusco, colapso repentino</p>	<p>As vistorias de Maio 1988 (JAE) e Janº 2001 (para outro objectivo) não identificam desvios, anomalias.</p>	<p><b>Obs. ELIMINAR!</b> Estes registos cabem na ilustração de outros "label" com mais sign<sup>ado</sup> ...</p>
<p><b>34</b></p> <p><b>ISOLAMENTO</b> (3-Pop. Contra Gov.)</p>	<p><u>Antes do acidente</u></p> <p>Esquecimento; desinteresse; afastamento do Mundo; acessibilidades; marginalização; interioridade</p>	<p>• Governo Central</p> <p>Esquecimento / afastamento do país, da Europa, por falta de acessibilidades =&gt; desinteresse dos governos, pobreza.</p> <p><b>Razões:</b></p> <ul style="list-style-type: none"> <li>- poucos eleitores</li> <li>- fixação da população às minas carboníferas do Pejão (encer. 95)</li> </ul>	<p><b>Obs. IMPORTANTE ?</b> Uma das causas "remotas" ...</p>
<p><b>39</b></p> <p><b>NEGLIGÊNCIA INCOMPETÊNCIA CORRUPÇÃO</b> (40-conjugação de factores)</p>	<p><u>Antes do acidente</u></p> <p>Negligência do poder político; conivência</p>	<p>Cascata de negligências : técnico que vistoriou / superior hierárquico / político responsável (1-da reestruturação e 2-pela situação actual) Corrupção de quem fiscaliza &amp; interesses do próprio Estado</p>	<p><b>Obs.</b> Separar estes conceitos: são diferentes !</p>
<p><b>1</b></p> <p><b>OPERAÇÃO DE CONSERVAÇÃO versus CONSTRUÇÃO DE NOVA PONTE</b> (18-Prazos; 19-Sacudir ...)</p>	<p><u>Antes do acidente</u></p>		<p><b>Obs. ELIMINAR!</b> não tem quase ocorrências; as que estão registadas cabem noutros conceitos</p>

(Nºficha) Open Coding	Tempo ; Termos	Conteúdos: intervenientes e acções	Novo(s) "label"
<p><b>27</b></p> <p><b>ORGANIZAÇÕES / ORGANISMOS ENVOLVIDOS</b></p> <p>(35-Diluição competências)</p>	<p>Antes do acidente</p> <p>Insuficiência; Inoperância; desconhecimento; desmotivação. "Acção que tem vindo a desarticlar sistematicamente a AdmPública sem qualquer plano nem estratégia"</p>	<p>• JAE • IEP • ICERR • ICOR // • IND • Capitania do Douro • Dir.Reg.Amb. e Ordenam. Território-Deleg. do Norte // • INAG(Inst.Água) • Marinha • Ministério do Ambiente</p> <p><i>Obs. - entenda-se como a organização por trás dos organismos....</i></p> <p>Governo entre si ("federação de varios ministérios") / Adm. Central e Local desconcertada (encruzilhada administrativa) / Operação de resgate (quem coordenaria? ; várias entidades têm competência sobre o rio) / Gestão geral dos recursos hídricos / Regime de excepção para o Douro (partilha) / JAE: 3 Inst<sup>os</sup>, complexidade legal, competências difusas, ocupação de cargos pelos "boys"; instabilidade / Areeiros: com 2 sociedades escapam entre as malhas.</p> <p>• Câmara de Castelo de Paiva • Secretaria de Estado das Obras Públicas • Governador Civil</p>	<p><b>Obs. IMPORTANTE!</b></p> <p>A menção tem que referir a "organização" por detrás do organismo... RE-DESIGNAR!</p>
<p><b>3</b></p> <p><b>POPULAÇÃO E AUTARQUIAS versus GOVERNO CENTRAL</b></p> <p>(5-Sentimentos colectivos 22-FluxoComInfo;34-Isol.)</p>	<p>Antes do acidente</p>	<p>"Clima de guerrilha constante"</p> <p>Isolamento</p>	<p><b>Obs.</b></p> <p>Não tem grande significado por si só... integrar noutros.</p>
<p><b>18</b></p> <p><b>PRAZOS: ANTES E DEPOIS DO DESASTRE</b></p> <p>(1-conserv.; 26-Timings)</p>	<p>Antes do acidente e Depois do acidente</p>	<p>Datas e cronologias precisas no âmbito de: nova ponte / relatório preliminar das causas / sucessivas alterações legislativas na gestão de recursos hídricos</p>	<p><b>Obs. ELIMINAR!</b></p> <p>não tem significado independente...(integrar noutros conceitos...)</p>
<p><b>24</b></p> <p><b>RESGATE DOS CORPOS</b></p> <p>(opções, procedim<sup>os</sup>, meios)</p>	<p>Depois do acidente</p> <p>Hipóteses; incógnitas; dúvidas; efectivos ;</p>	<p>Aspectos técnicos</p> <p>Aspectos organizacionais: exemplifica também a indefinição de competências...</p>	<p><b>Obs. ELIMINAR!</b></p> <p>não tem importância para o tema (mas algs aspectos poderão tb ilustrar uma análise "des-organizac<sup>al</sup>...)</p>

<b>(Nºficha) Open Coding</b>	<b>Tempo ; Termos</b>	<b>Conteúdos: intervenientes e acções</b>	<b>Novo(s) "label"</b>
<p><b>[8]</b>  <b>RESPONSABILIDADE: níveis hierárquicos, esferas de competência...</b>                      (12-Responsabilização 30-CargTéc;35-Diluição...)</p>	<p><u>Antes do acidente</u>                      Organismos administrativos e serv.ºs técnicos; responsabilidades de quem exerce o poder; responsável político (eleito) ≠ comissário político (nomeado)</p>	<p>• Ministério do Equipamento Social • IEP • ICERR • ICOR                      • Capitania do Douro • Dir.Reg.Ambiente e Ordenamento do Território-Delegação Norte =&gt; Ministério do Ambiente                      • IND =&gt; Ministério da Administração Interna                      Distinção de responsab. políticas e técnicas (tb disciplinares, financeiras, patrimoniais) / resp. directas e indirectas / resp. assumidas e apuradas.                      Refira-se ambivalência: uma perspectiva meramente legislativa &amp; outra que contempla as implicações ambientais das actividades.</p>	<p><b>Obs. Importante...</b>                      mas a rever ! c/12 é perspectiva geral e "abstracta"</p>
<p><b>[12]</b>  <b>RESPONSABILIZAÇÃO versus DES-RESPONSABIL.</b>                      (8-GarantSegur; 37-ApurCausas)</p>	<p><u>Antes do acidente e Depois do acidente</u>                      Irresponsabilidade; impunidade; conspiração de silêncio; conivência; responsabilidades (penal/civil/política); deveres funcionais; inquérito esclarecimº, apuramº de responsabilidades.</p>	<p><b>Organismos Administrativos</b> (Min.; SecEst)/ <b>Serv.ºs Técnicos</b> (Inst,DirServ)                      • IEP • ICERR • Secr.º Estº OPúbliº • Pres.Câm. C. Paiva                      • Ministério do Ambiente • IND • Admin. Públiª Nacional                      Serviços (cultura da complacência e cumplicidade interna) + altos funcionários e agentes públicos / Há responsabilidade civil extra-contratual do Estado / Negligência grave do Governo na falta aos prazos e compromissos que assume / Políticos e dirigentes de Organismos Técnicos podem ter responsabilização criminal (homicídio por negligência)                      Questões centrais: • tiveram conhecimento de falta de condições de segurança? • Tinham poder (&amp; meios) para intervir? • De facto nada fizeram em tempo útil?</p>	<p><b>Obs. Importante...</b>                      mas a rever ! c/8 atribuição de responsabilidade especificamente neste acidente</p>
<p><b>[29]</b>  <b>RESULTADOS CONTRÁRIOS AO PREVISTO</b></p>	<p><u>Antes do acidente</u>                      Objectivo era ... mas resultado; procuraram ordenar ... mas em vez de...</p>	<p>• JAE • IEP • ICERR • ICOR                      • IND                      - Um dos objectivos da organização da ex-JAE em 3 Institutos, era segurar bons engenheiros =&gt; sucedeu saída "em massa" e entrada para Dir.Serv. não pela Q. técnica, mas por serem jovens quadros do partido.                      - Com criação do IND procurou-se ordenar sector de extracção de areias =&gt; "negócio da China" para areiros e para o Estado</p>	<p><b>Obs. ATENÇÃO !</b>                      Parece interessante embora com poucos registos !!!!</p>

(Nºficha) Open Coding	Tempo ; Termos	Conteúdos: intervenientes e acções	Novo(s) "label"
<p>19</p> <p>"SACUDIR A ÁGUA DO CAPOTE"</p> <p>(20 -Salvar a face)</p>	<p>Depois do acidente</p> <p>Regeitar responsabilidades; apontar o dedo; acusação; descartar publicamente responsabilidades</p>	<p>• ICERR • ICOR • Govern. Civil • Presid. Câmara CP • ex-Secr. Est. OPúblicas • Ministro Ambiente • DRAN</p> <p>- Governo não recebeu infos de organismos técnicos / fiscalizadores</p> <p>- Entidade licenciadora nega extracção ilegal</p> <p>- Gov. Civil não travou obras e não recebeu aviso algum</p> <p>- IEP aponta IND</p> <p><i>Ninguém tem mãos limpas; Acusação generalizada, recíproca + ou – velada (Areeiros-&gt;Barr. Torrão e descargas anormais / Inst. ex-JAE-&gt;areeiros / técnicos-&gt;políticos / políticos entre si / Gov. e Opos)</i></p>	<p><b>Obs. ELIMINAR!</b> Atravessa tudo ... mas ... será para manter ?</p>
<p>20</p> <p>"SALVAR A FACE"</p> <p>(19 -Sacudir)</p>	<p>Depois do acidente</p>		<p><b>Obs. ELIMINAR!</b> - poucas ocorrências registadas e -confunde-se c/"Sacudir"</p>
<p>14</p> <p>SECRETISMO (Info não-pública)</p> <p>(17 -Comun. pública)</p>	<p>Depois do acidente</p> <p>Conspiração de silêncio; exortar a revelar; não há resposta; recusa ... fica-se sem saber</p>	<p>Envolve antigos e actuais responsáveis ! Serviços Públicos não respondem [ao público, através dos "media"] porque :</p> <ul style="list-style-type: none"> <li>- não sabem ?</li> <li>- não querem ?</li> </ul> <p><b>Comunicação que não se faz, isto é, que não se realiza... Cf. f. 17</b></p>	<p><b>Obs. ELIMINAR</b> - poucas ocorrências registadas MAS - está muito dispersa em outros conceitos como "responsabilização", etc)</p>
<p>5</p> <p>SENTIMENTOS COLECTIVOS (tragédia, revolta)</p> <p>(4-Vítimas; 3-Popul. Autarqu)</p>	<p>Depois do acidente</p>	<p>... o inventário de doenças que todos sabemos mas que só um "choque emocional" ... "como este permite trazer à luz de forma concentrada e em toda a sua crueza"</p>	<p><b>Obs. ELIMINAR!</b></p>

<b>(Nºficha) Open Coding</b>	<b>Tempo ; Termos</b>	<b>Conteúdos: intervenientes e acções</b>	<b>Novo(s) "label"</b>
<p>26</p> <p><b>TIMINGS</b></p> <p>(18-Prazos; 25-Alertas)</p>	<p>Depois do acidente(essencial/)</p> <p>Rapidez; precipitar-se; ritmo lento; urgente; acelerar; morosidade; imediato; celeridade; prioridade; curto prazo; emergência; depressa; minimizar tempo; adiamento</p>	<p>• MinistroES Jorge Coelho • SecrEstOP • IND • especialistas • MinistroAInterna • IEP • Governo / C CP • Portugal/Espanha</p> <p>JCoelho prometera ritmo de pressão sobre empreiteiros no mandato / rápida demissão do Ministro / transitando anualmente no PIDDAC, nova ponte vai esperar + alguns anos... / Processos lentos dos ciclos de sedimentos / Cinco cheias;barragem Torrão retém -&gt; descaçamento recente do pilar / Gov. legisla p/ desburocratizar. Nova colaboração autoridades polí&amp;judic Port-Esp / indemnizações céleres</p>	<p><b>Obs.</b> Avaliar: tem múltiplas facetas e incidências... ritmos de tempo, cadências (+ lentas ou + aceleradas)</p>
<p>4</p> <p><b>VÍTMAS</b> (significado)</p> <p>(5-Sentimentos colectivos)</p>			<p><b>Obs. ELIMINAR!</b> Não tem quase ocorrências (apenas dá dimensão do desastre...)</p>
<p>33</p> <p><b>"Wishful thinking"</b></p> <p>(2-Aparente segurança)</p>		<p>"Jogaram todos com a sorte..."</p>	<p><b>Obs. ELIMINAR!</b> Não apresenta quase ocorrências...</p>

**APPENDIX K**

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**FURTHER ANALYSIS OF OPEN CODES**



**Análise ulterior dos "Open Codes"**

1º "label"	Reformulação	2º(s) "label(s)"	Prior. <sup>de</sup>
<p><b>Fiscalização</b></p> <p>32</p> <p>RC</p>	<p><b>Reformulação</b></p> <p><i>Obs: aplica-se a várias áreas/sectores e níveis diferentes</i></p> <p>Conceito que requer "qualificação" ...</p> <ul style="list-style-type: none"> <li>- inexistente</li> <li>- inoperante</li> <li>- corrupta.....etc</li> </ul> <p>Pressupõe uma: <b>Regulamentação</b></p>	<p>FISCALIZAÇÃO</p> <p>REGULAMENTAÇÃO</p>	
<p><b>Fluxo da comunicação e informação</b></p> <p>22</p>	<p>Factor importante nesta temática :</p> <p>as suas "Brechas" contribuem largamente para o Erro!!!</p>	<p>FLUXO DE COMUNICAÇÃO E INFORMAÇÃO</p>	
<p><b>Furar regras</b></p> <p>31</p>	<p>Uma das causas de Erro</p> <p><b>RC : BRECHAS</b></p> <p><b>RC : REGULAMENTAÇÃO</b></p> <p><b>RC : FISCALIZAÇÃO</b></p>	<p>FURAR REGRAS</p>	
<p><b>Organizações/Organismos envolvidos</b></p> <p>27</p>	<p><i>Obs: requer subdivisão em níveis organizacionais diferentes (macro*/mezzo/micro)</i></p> <ul style="list-style-type: none"> <li>• político-legislativos</li> </ul> <p>(Instabilidade político-administrativa)</p> <p>Múltiplos <b>RC : INDEFINIÇÃO DE COMPETÊNCIAS ; FURAR REGRAS ; OCUPAÇÃO POLÍTICA DE CARGOS TÉCNICOS, etc</b></p>		

### Análise ulterior dos "Open Codes"

1º "label"	Reformulação	2º(s) "label(s)"	Prior. de
<p><b>25</b></p> <p>Alertas prévios</p>	<p>⇒ Existentes e desvalorizados (devido aos vários "vícios organizacionais")  <b>RC: "WISHFUL THINKING" (veio a ser retirado...)</b></p> <p>⇒ Inexistentes (por diferentes causas: má fiscalização, incompetência, corrupção, etc)  <b>RC: REGULAMENTAÇÃO</b>  <b>RC: FISCALIZAÇÃO</b></p>	<p>ALERTAS</p>	
<p><b>29</b></p> <p>Resultados contrários ao previsto</p>	<p><i>Observação: estratégia organizacional, caos e complexidade</i></p> <p><i>Aqui não há número significativo de registos mas...no entanto parece significativo!!!</i></p> <p>Exs: Reestruturação da JAE, papel do IND, até demissão do Presidente do IEP...</p>	<p>RESULTADOS CONTRÁRIOS AO PREVISTO</p>	
<p><b>34</b></p> <p>Isolamento</p>	<p>Uma das causas [potenciadoras] de Erro</p> <p>Obs.: fenómeno "sociológico" (a nível macro)? Também organizacional = falta de atenção devida...</p>	<p>ISOLAMENTO</p>	
<p><b>39</b></p> <p>Negligência Incompetência Corrupção</p>	<p>Inclui várias das causas de Erro. A subdividir:</p> <p>---acção omissa ou insuficiente ou errada por falta de diligência -----</p> <p>---acção omissa ou insuficiente ou errada por falta de conhecimento -----</p> <p>---acção omissa ou insuficiente ou errada por interesse/favorecimento particular -----</p> <p><b>RC: FACTORES HUMANOS</b></p>	<p>NEGLIGÊNCIA INCOMPETÊNCIA CORRUPÇÃO</p>	



## Análise ulterior dos "Open Codes"

1º "label"	Reformulação	2º(s) "label(s)"	Prior. de
<p>9</p> <p><b>Garantias de segurança</b></p>	<p><i>Obs.: verifica-se disproporção entre :</i></p> <p><i>por um lado</i></p> <ul style="list-style-type: none"> <li>➢ conceito que reflecte dever do Estado para com os cidadãos com implicação de responsabilidade civil extracontratual e</li> <li>➢ recursos organizacionais necessários para o respectivo cumprimento (pessoas, verbas, procedimentos)</li> </ul> <p><i>por outro lado</i></p> <ul style="list-style-type: none"> <li>➢ meios existentes na realidade</li> </ul>		
<p>3</p> <p><b>População e autarquias versus Governo Central</b></p>	<p><i>Obs.: registos deste OC cabem noutros "labels" ...</i></p> <p>ISOLAMENTO ; FLUXO DE COMUNICAÇÃO...</p>	<p>(ISOLAMENTO)</p> <p>(FLUXO DE COMUNICAÇÃO...)</p>	
<p>37</p> <p><b>Apuramento das causas</b></p>	<p><i>Obs.: Desaparece ! Retirar as causas específicas para:</i></p> <ul style="list-style-type: none"> <li>▪ se descarregador funcionou deficientemente (10/15 m) na Barragem do Torrão e aumentou a velocidade das águas do Tâmega</li> <li>▪ se areiros criaram condições para derrocada / deterioraram bens do domínio público</li> </ul>	<p>FACTORES TECNOLÓGICOS ???</p> <p>(extracção de inertes)</p>	
<p>23</p> <p><b>Erros e acid. EoR: soluções preventivas</b></p>	<p><i>Obs.: Desaparece ! Retirar as causas específicas (referidas pela SUA "omissão") para:</i></p> <ul style="list-style-type: none"> <li>▪ vistorias com particular atenção às fundações -----</li> <li>▪ rotinas de inspecção e manutenção : plano sistemático de fiscalização -----</li> <li>▪ regras para (direitos e responsabilidades) dos Gestores Públicos -----</li> </ul>	<p>(FISCALIZAÇÃO)</p> <p>(FISCALIZAÇÃO)</p> <p>(RESPONSABILIZAÇÃO)</p>	

### Análise ulterior dos "Open Codes"

1º "label"	Reformulação	2º(s) "label(s)"	Prior. <sup>de</sup>
<p>13</p> <p>Erros e acid. EoR: subseqüências</p>	<p>Obs.: Desaparece ! Retirar as causas específicas para:</p> <ul style="list-style-type: none"> <li>▪ projectos para acabar com ISOLAMENTO do concelho</li> <li>▪ alterar sistemas de fiscalização de pontes e outras estruturas várias</li> </ul>	<p>(ISOLAMENTO)</p> <p>(FISCALIZAÇÃO)</p>	
<p>30</p> <p>Exercício de cargos técnicos / funções especializadas por pessoas de perfil político</p>	<p>Uma das <u>causas de Erro</u></p>	<p>OCUPAÇÃO POLÍTICA DE CARGOS TÉCNICOS</p> <p><b>NC</b>: NEGLIGÊNCIA <b>NC</b>: INCOMPETÊNCIA <b>NC</b>: CORRUPÇÃO</p>	
<p>36</p> <p>Formalização teórica <i>versus</i> prática informal</p>	<p>Obs.: Desaparece !</p> <p>Será também um "FURAR REGRAS"</p>	<p>(FURAR REGRAS)</p>	

**OC**: opposite concept  
**BC**: broader concept  
**NC**: narrower concept  
**RC**: related concept

**APPENDIX L**

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**DEFINITIONS OF REDUCED OPEN CODES**

## Definitions of reduced Open Codes

	"Open Concepts"	Qualidades que estão implicitamente reconhecidas em cada um dos casos classificados na categoria em causa
1.	ALERTAS	<p>Chamadas de atenção, avisos prévios relativos a problemas potenciais.</p> <p>Tanto se referem a mensagens (orais, escritas ; informais, formais) de origem humana, como a sinais de carácter "tecnológico", isto é, a anomalias objectivas que – de modo mais ou menos perceptível – traduzem uma situação anómala que lhes está por trás.</p> <p>No caso em análise não existiram e/ou não foram atendidos.</p>
2.	BRECHAS	<p>Omissões em matéria de informações que deveriam ser explícitas e completas mas que – em virtude desses vazios, <i>hiatos</i> - "deixam espaço" à geração de interpretações várias (erróneas, permissivas, etc)</p> <p>Falhas decorrentes de <i>hiatos</i> verificados entre, por um lado, a missão atribuída / os objectivos de uma Organização e por outro, os recursos disponíveis para os pôr em prática</p> <p><i>Corte, interrupção</i> numa sequência/cadeia de procedimentos, de fases, <b>que deveriam ser contínuas e/ou articuladas.</b></p>
3.	CONJUGAÇÃO DE FACTORES	<p>Confluência imprevista, improvável e/ou anormal de factores provocando em consequência um acontecimento único ou uma cascata de efeitos subsequentes e indesejáveis.</p> <p>Associação de factores diversos (quanto à sua natureza, cronologia/temporalidade e ritmo) os quais contribuem para um ou mais resultados que não se teriam verificado no caso:</p> <p>a) de os agentes actuarem <b>de forma estanque/independente, como seria suposto suceder;</b></p> <p>b) se houvesse adequada previsão relativa aos "outcomes" possíveis dos processos subsequentes</p>
4.	CORRUPÇÃO	<p>Neste caso o agente, podendo embora desempenhar competente e cuidadosamente as funções de que é responsável, poderá igualmente incorrer em omissão de acção, acção incompleta, acção errada, todas elas potencialmente geradoras de acidente. O motivo prende-se aqui com o favorecimento de terceiros a troco de benefícios próprios e/ou também de terceiros sempre de forma ilícita.</p> <p>No caso em análise, aplica-se à função de "fiscalização" e constitui violação do dever de "diligência".</p>

	<b>“Open Concepts”</b>	<b>Qualidades que estão implicitamente reconhecidas em cada um dos casos classificados na categoria em causa</b>
5.	<p><b>FACTORES HUMANOS</b></p> <p>[Organizacionais e individuais]</p>	<p>Agregam uma multiplicidade de factores e agentes que são analisados individualmente na sua contribuição específica para a matéria em análise.</p> <p>Extracção de inertes</p> <p><i>Poder-se-ão considerar deste modo quando têm quotas partes de contributo Humano e da Natureza?</i></p>
6.	<p><b>FACTORES ? MISTOS ?</b></p> <p>[Extracção de inertes]</p>	<p>Extracção de inertes ; construção de barragens a montante ; malfuncionamento de comporta?</p> <p>Factores de origem natural que contribuem para um determinado resultado.</p> <p>Elementos vários não dependentes da vontade humana...mas no entanto,.....tendo também em consideração a noção do “impacte que alguns modelos de desenvolvimento têm provocado na Natureza.”</p>
7.	<p><b>FACTORES DA NATUREZA</b></p> <p>[Cheias]</p>	<p><i>Cheias, tempestade, [caudal do rio], etc</i></p> <p>Actividades relativas à vigilância de estruturas construídas pelo Homem e/ou pertencentes ao património natural e que lhe estão confiadas, visando garantir a <i>nível imediato</i>, tanto a segurança de pessoas e bens como a <i>médio/longo prazo</i> a própria conservação &amp; preservação do Meio Ambiente e/ou do património (natural, histórico, equipamento social) em si mesmo.</p> <p>Este conceito deve fazer sentido quando articulado com uma adequada “Regulamentação” (ver <i>definição</i>) que proporciona as linhas orientadoras para este processo.</p>
8.	<p><b>FISCALIZAÇÃO</b></p>	

	<b>Qualidades que estão implicitamente reconhecidas em cada um dos casos classificados na categoria em causa</b>
9.	<p><b>FLUXO DE COMUNICAÇÃO / INFORMAÇÃO</b></p> <p>Refere-se à circulação das mensagens de acordo com as necessidades previstas, isto é, visando os objectivos que lhe deram origem, bem como todos as situações de entrave, e distorção e/ou simples interrupção do fluxo considerado adequado e/ou desejado.</p> <p>Engloba qualquer dos veículos/suportes utilizados na tramitação dessas mensagens.</p> <p>Considera situações intra- e inter- organizacionais. Pode resultar de atitude intencional ou não.</p>
10.	<p><b>"FURAR" REGRAS</b></p> <p>Abrange um conjunto de situações diversas:</p> <ul style="list-style-type: none"> <li>• não existindo textos regulamentadores – situação facilitadora de ausência de organização e/ou de organização deficiente ; gerando práticas aleatórias, não-sistemizadas, frequentemente contraditórias.</li> <li>• existindo textos regulamentadores - preenchimento casuístico e não-autorizado das "falhas", lacunas, hiatos existentes na sua redacção ; interpretação casuística de textos pouco claros ; leitura distorcida, de acordo com conveniências diversas.</li> </ul> <p>Estas situações terão na sua génese intencionalidade ou não-intencionalidade.</p> <p>Este conceito pode ter 2 perspectivas diferentes:</p> <ul style="list-style-type: none"> <li>negativa = nociva, enquanto despreza normas de segurança, por ex.</li> <li>positiva = inovadora, quando tornar rigidez burocrática, por ex.</li> </ul>
11.	<p><b>INCOMPETÊNCIA</b></p> <p>Exercício de uma função e/ou desempenho de uma tarefa para as quais o agente não está devidamente habilitado e/ou não tem os conhecimentos requeridos. Neste caso o agente poderá estar atento e empenhado na execução ; é a sua capacidade de atingir os objectivos em vista que não existe. Pode verificar-se omissão de acção, acção incompleta, acção errada, todas elas potencialmente geradoras de acidente.</p> <p>O ónus da incompetência recairá não só no agente que assume um papel para o qual não está preparado, mas também em quem o indigita no caso de ter conhecimento dessa situação.</p> <p>No caso em análise, aplica-se à função de "fiscalização" e constitui violação do dever de "diligência".</p>
12.	<p><b>INDEFINIÇÃO DE COMPETÊNCIAS</b></p> <p>Diluição na atribuição funcional – verificada a nível de indivíduos (cargos funcionais) e de organizações (atribuições institucionais) – traduzindo-se quer em sobreposição e partilha de competências, quer em ausência de responsabilidades que estejam inequivocamente atribuídas.</p> <p>É resultante de diversas causas entre as quais: diplomas legais pouco claros, complexidade resultante de reengenharia organizacional, incorrecta transferência de poderes, divergências verificadas entre o formalismo teórico e a informalidade pragmática.</p> <p>Articula-se com: "responsabilização" ; "fiscalização/regulamentação".</p>

	<b>"Open Concepts"</b>	<b>Qualidades que estão implicitamente reconhecidas em cada um dos casos classificados na categoria em causa</b>
13.	ISOLAMENTO	<p>Considera-se aqui um conjunto de referências ao estado de esquecimento e/ou abandono, das populações da região (concelho de Castelo de Paiva) relativamente ao restante país.</p> <p>Incluem : falta de "peso" na resolução de processos que lhes dizem directamente respeito, falta de capacidade de se fazer ouvir, marginalização em matéria de alocação de recursos nacionais e também provindos da UE, desinteresse do Governo Central quanto: à melhoria das acessibilidades ao/no local; a uma organização político-administrativa e de optimização de recursos que tenha em conta a conveniência dos habitantes e(num limite) a própria segurança de pessoas e bens.</p> <p>Constituirá um "ciclo vicioso" Tem reflexos a todos os níveis político-administrativos.</p>
14.	NEGLIGÊNCIA	<p>Falta de cumprimento de um dever e/ou responsabilidade atribuída a uma pessoa no exercício das funções que lhe estão atribuídas. Incúria no desempenho das funções de que o agente é responsável, não levando a cabo todos os procedimentos que seriam profissionalmente possíveis e/ou tecnicamente recomendados, tendo em conta os meios postos aos seu dispôr e a responsabilidade que assumiu. O agente ainda incorrerá em negligência quando - esgotada a sua capacidade profissional e/ou atingido o limite da sua esfera de acção - não alertar outrém para a insuficiência da sua intervenção tendo em conta os potenciais perigos daí decorrentes. Independentemente de se tratar de uma atitude pontual ou sistemática, pode verificar-se omissão de acção, acção incompleta, acção errada, todas elas potencialmente geradoras de acidente.</p> <p>No caso em análise, aplica-se à função de "fiscalização" e constitui violação do dever de "diligência".</p> <p>Trata-se de um aspecto específico identificado no caso em análise, que se pode considerar como assumindo contornos do que foi aqui descrito como "Corrupção", pressuporá "Incompetência", podendo ainda presumir "Negligência".</p> <p>Articula-se com a "responsabilização".</p> <p>Também contribui para um factor de "Instabilidade organizacional" ...</p>
15.	OCUPAÇÃO POLÍTICA DE CARGOS TÉCNICOS	
16.	ORGANIZAÇÃO E GESTÃO	<p>Inclui:</p> <ul style="list-style-type: none"> <li>- os elementos relativos à estrutura e funcionamento de um organismo/organização;</li> <li>- a articulação de vários organismos entre si;</li> <li>- à escala nacional, o próprio sistema político-administrativo do país.</li> </ul>

	<b>"Open Concepts"</b>	<b>Qualidades que estão implicitamente reconhecidas em cada um dos casos classificados na categoria em causa</b>
17.	<b>REGULAMENTAÇÃO</b>	<p>Conjunto de meios (mecanismos e "ferramentas") que orientam as actividades de "Fiscalização" (ver definição): normas e regras que recomendam e/ou definem (de modo formal e mais ou menos normativamente) quais os procedimentos considerados adequados em cada caso. Este conceito abrange também os planos que devem orientar a transposição dessas regras para a prática (fases, meios a envolver, avaliações, etc).</p>
18.	<b>RESPONSABILIZAÇÃO</b>	<p>Entende-se como o outro face do binómio "responsabilidade" entregue e assumida : corresponderá a um "pedir contas" do exercício da responsabilidade que foi atribuída e aceite. Aplicando-se o conceito de "Responsabilidade" a vários níveis sócio-profissionais e políticos, várias especialidades e sectores, naturalmente que a subsequente "Responsabilização" implica também muitas diferentes vertentes: criminal, civil, política, técnica, etc</p> <p>No caso em análieis, tem também forte representação pelo seu antónimo: impunidade, fuga à responsabilização.</p>
19.	<b>RESULTADOS CONTRÁRIOS AO PREVISTO</b>	<p>Refere-se a estratégias, planeamentos visando determinados objectivos os quais, quando da sua concretização prática, isto é, no decurso da sua implementação, produzem efeitos diferentes – e até de sentido diametralmente oposto – àqueles que eram esperados.</p> <p>No caso em análise verificam-se por interferência de outros factores num processo visto como uma relação causal simples... Seja por "conjugação de factores", seja por "brechas".</p> <p>Este conceito advém de avaliações incompetentes e/ou factores aleatórios e "acidentais".</p>

**APPENDIX M**

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CONCEPTUAL DISTINCTION INTO CATEGORIES,  
PROPERTIES, DIMENSIONS

## Conceptual distinction into Categories, Properties, Dimensions

Caso substantivo

### CATEGORIAS

Influencing factors for disaster

### PROPRIEDADES

Alert existence  
(1-Alertas)

Alert awareness  
(1-Alertas)

Communication flow conditions  
(9-Fluxo Com. Informação)

Communication contents' qualifiers  
(9-Fluxo Com. Informação)

Message types

Message degree of formality

Resource conditions

Isolation  
(13-Isolamento)

### DIMENSÕES

Human messages  
Technical signs  
Nature signs

(Degree of) signs' interpretation ability  
(Degree of) attention to signs

Communication breakdowns  
Communication gaps  
Communication distortion

Message ambiguity  
Message completeness  
Message adequacy to goal

Oral / Written

Distance from availability to necessity

Resource allocation level  
Degree of participation in decisions  
Level of effective communication

**DIMENSÕES**

Negligence (14-Negligência)  
 Incompetence (11-Incompetência)  
 Corruption (4-Corrupção)

Intra-organizational level  
 Inter-organizational level  
 National level

Construção de barragens  
 Extracção de inertes

**PROPRIEDADES**

Individual behavior

Organizational linking levels  
 (16-Organização e Gestão ?)

Level of regulations  
 (17-Regulamentação)

Degree of control  
 (8-Fiscalização)

Outcomes' forecast

Skipping the rules  
 (10-Furar regras)

Functional attribution quality  
 (12-Indefinição de competências)

Attribution of responsibilities  
 (18-Responsabilização)

Filling of technical job positions  
 by political staff  
 (15-Ocupação política de cargos técnicos)

Impact evaluation levels

Interpretation of rules' ambiguity  
 Filling of rules' gaps  
 Convenience distortion of rules  
 Avoiding burocratic cons

Organizational Mission clarity  
 Individual competency definition clarity  
 Functional overlapping  
 Functional emptiness

**CATEGORIAS**

Organizational conditions to disaster  
 (5-Factores Humanos, 6-Fact. Mistos)

**DIMENSÕES**

**PROPRIEDADES**

**CATEGORIAS**

Global/local climate changes

Natural conditions to disaster  
(7-Factores da Natureza)

Degree of probability

Independent factors' assemblage  
(3-Conjugação de factores)

Disaster mechanisms

Assemblage timings  
Assemblage rythms  
Assemblage shaping

Independent factors' assemblage  
process  
(3-Conjugação de factores)

Undesired breaks  
(2-Brechas)

Outcomes opposite to forecasts  
(19-Resultados contrários ao previsto)

**APPENDIX N**

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**CONCEPTUAL CATEGORIZATION AND  
PRELIMINARY RELATIONS**

**Conceptual categorization and preliminary relations**

Caso substantivo

**DIMENSÕES**

**PROPRIEDADES**

**CATEGORIAS**

**CONDIÇÕES INICIAIS (causais)**

Organizational re-engineering

Outcomes opposite to strategic aims  
(19-Resultados contrários ao previsto)

PONTES:  
saída de técnicos da JAE

AREIAS:  
fiscalização como fonte de  
financiamento do IND

**CONDIÇÕES CONTEXTUAIS (internas/situacionais ; potenciadoras/possibilitantes)**

Non-existent / governmental laws

Regulations' availability level

Control mechanisms  
(17-Regulamentação; 8-Fiscalização)

Contexts' adjustment degree  
Usage/compliance degree  
Degree of rules' ambiguity  
Degree of rules' gaps

Regulations' efficiency level

Formally assigned  
Effectively available

Existence of control agents' (Organ<sup>s</sup>/Indiv<sup>s</sup>)

**DIMENSÕES**

**PROPRIEDADES**

**CATEGORIAS**

Organizational factors	Organizational linkage failure (16-Organização e Gestão ?)	Intra-organizational level Inter-organizational level National level
Resource conditions	Alert awareness (1-Alertas)	Distance from availability to necessity  (Degree of) consciousness to signs (Degree of) signs' interpretation ability
Info/communication factors (9-Fluxo Com. Informação)	Communication flow conditions	Communication breakdowns Communication gaps Communication distortion
	Communication contents' qualifiers	Message ambiguity Message sufficiency Message adequacy to goal
	Isolation (communication barriers) (13-Isolamento)	Poor participation in decisions Difficult allocations' needs

**DIMENSÕES**

**PROPRIEDADES**

**CATEGORIAS**

Facilitating event mechanisms	Independent factors' assemblage (3-Conjugação de factores)	Degree of probability
	Independent factors' assemblage process (3-Conjugação de factores)	Timings Rhythms Shaping
	Unexpected breaks on a sequence (2-Brechas)	Degree of probability
	Unplanned breaks effects	Process interruption Retroactive feed-back

**CONDIÇÕES INTERVENIENTES (influenciadoras)**

Cheias

Natural influences to disaster (7-Factores da Natureza)	Global/local climate changes
Human influences to disaster (5-Factores Humanos; 6-Fact. Mistos)	Individual behaviour Negligence (14-Negligência) Incompetence (11-Incompetência) Corruption (4-Corrupção)

**DIMENSÕES**

**PROPRIEDADES**

**CATEGORIAS**

Organ <sup>onal</sup> influences to disaster	Loose functional requirements (12-Indefinição de competências)	Organizational Mission clarity level Individual competency definition clarity level Functional overlappings Functional gaps
	Unclear responsibility mapping (18-Responsabilização)	Loose sense of responsibilities
	Skipping the rules (10-Furar regras)	Pragmatic/simplifying reasons Intentional ilegal purposes

**RESULTADOS / CONSEQUÊNCIAS**

Filling of technical job positions by political staff (15-Ocupação política de cargos técnicos)	Lack of expertise	Technical mistakes Unproprer decision analysis Impacts' evaluation inability
		Construção de barragens e Extracção de inertes

**APPENDIX O**

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**AN OVERALL CHRONOLOGICAL FRAMEWORK**

# An overall chronological framework

Governo Constitucional		Momentos/datas significativas para o caso	
Nº	Datas	Pontes & Estradas	Áreas
			<b>Ponte</b> 1883-Memª descrit projecto
IX	1983.06.09	1983 DL – Regulamento de Segurança e Acções para estruturas de Edifícios e Pontes.	1986, Dez-video vistoria ETEC 1986, Dez-relatório ETEC; recomend. pilares
X	1985.09.06		1990-encerr.-melhorias tab.
XI	1987.08.17		1993-Recommend ETEC 1993-despacho PrJAE p/ construção URGÊNCIA
XII	1991.10.31	1993 – JAE: 19 “quadros” na conservação de pontes	1998 Maio-ult. inspec. JAE 1998 Nov-carta PresC CP 1999/98-reparação técnica?
XIII	1995.10.28	1994 – IGOP inspecciona DGSP=>deficiências!!! 1997/8 – Sindicância: suspeita corrupção. Já há “sangria de pessoas” 1998 – JAE lança concurso público... não há adjudicação 1999 – Extinção JAE=> 3Ins. IEP + ICERR + ICOR Mais “sangria de pessoas” Dúvidas de atribuições...	1993-DRAN<MA.....+ 1994-Lei utilização dominio hídrico=>fiscaliz. inertes rios 1994-1997-MA gestão geral recursos hídricos *concessão-DRAN *fiscalização-CapDouro< SEAdmPort<MEq 1997 Jun-Criado IND<MA p/ superintender canalDouro. Tutela partilhada c/ MEq e MPlan (consultivos). 1999-IND passa a tutela exclusiva ME. Taxas de extracção passam da DRAN para IND mas... não a fiscalização total ???
XIV	1999.10.25		2000?-vistoria para conduta 2000 Setembro-carta alerta 2000 Dezembro-vistoria DirEstrPorto; Relatório c/ recomendações > despacho que não segue > aposentação... 2001 Jan-vistoria de superfície do ICERR 2001.01.17/18-info SecEOP contraditórias acerca data construção nova ponte
			<b>5 Março 2001-queda</b>

**APPENDIX P**

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EXTRACTS FROM THE SOURCE ARTICLES

## Extracts from the source articles cited in the "Results" section

### Government influence over organizations

#### "Central power re-engineering decisions"

[Ex010310EXPdequem] «O que aconteceu à JAE, "reestruturada" (...) é um bom exemplo da acção negativa dos últimos governos (...) que têm vindo a desarticular sistematicamente a administração pública, com perda de eficácia dos vários organismos, sem qualquer plano nem estratégia. (...) O que se impõe, urgentemente, é traçar um plano para a reforma dos organismos públicos (...) e criando a seguir condições para que tenham estabilidade, não flutuem ao sabor das mudanças políticas e das alterações de humor dos ministros»

[Pbd010306PUBLfalta] «(...) críticas de falta de fiscalização apontadas por vários especialistas, que relacionam esta ausência com o desmantelamento da JAE em 1999, (...). Na altura foram criados três novos organismos (...). Para (...) do Instituto Superior Técnico, aqui reside a chave do problema.»

[Ex010317EXPareias] *The whole article describes organizational changes occurred at the Douro River domain under the title «Areias do Douro sem controlo» and mentions that «(...) Esta situação aconselharia uma vigilância mais apertada, mas neste momento os Ministérios do Ambiente e do Equipamento trocam-se de razões sobre a quem compete a fiscalização das areias do rio Douro.»*

[Pbd010305PUBLirrespons] «A velha ética republicana da virtude política, que incluía um apurado sentido de responsabilidade individual no exercício de cargos públicos, mal encontra ecos na prática política e administrativa de hoje entre nós. (...) Uma cultura de complacência e de cumplicidade interna dos serviços, conjugada com uma débil tradição de responsabilidade disciplinar e financeira dos altos funcionários e agentes públicos (...) Por isso, no caso de Entre-os-Rios (...) É necessário averiguar as responsabilidades disciplinares e patrimoniais dos organismos administrativos e dos serviços técnicos especificamente encarregados da monitorização, manutenção e segurança rodoviária. (...) A tragédia de Entre-os-Rios deve ser transformada num desafio à capacidade de reforma da nossa cultura de complacência, irresponsabilidade e impunidade pública.»

[Pbd010309PUBLaosabor] *The whole article comments on accountability issues and also on the blame hastiness developing after any such disaster.*

[Ex010310EXPdequem] «Quando acontece uma tragédia, os portugueses (...) apontam responsáveis. (...) Mas amanhã (...) tudo voltará à "normalidade". E, no entanto, as coisas talvez devessem passar-se exactamente ao contrário»

[[Pbd010315PUBLestado] «Quase tudo o que integra o processo em curso à administração pública nacional está aqui presente nesta lamentável história das areias: a ausência de uma cultura de responsabilidade e de serviço público, a permeabilidade a interesses particulares, a surdez face aos avisos e queixas da sociedade, a falta do mais elementar sentido do dever. E a corrupção, evidentemente.»

[DN010315PUBLtomada] «Depois, o governante teve de voltar a rejeitar quaisquer responsabilidades do seu ministério sobre o desastre de Entre-os-Rios. "Não confundamos causas com responsabilidades", frisou o ministro (...)»

#### Organizations' Legoin and Colage

##### "Shifting of organizational relative positions"

[Pbd010307PUBLconservaç] «A jurisdição sobre pontes, que na extinta Junta Autónoma das Estradas pertencia à Direcção de Serviço de Pontes, parece ter sido mesmo completamente diluída com a criação dos novos organismos (...) »

[Pbd010309PUBLind] «O presidente do Instituto de Navegabilidade do Douro (IND), Mário Fernandes, recusou ontem a responsabilidade exclusiva daquele organismo na fiscalização de dragagens e descargas no Douro, (...). Afirmou à Lusa que a fiscalização é também feita pela Direcção Regional do Ambiente e pela capitania do Porto do Douro, apesar de ser o IND, tutelado pelo ministério do Equipamento Social a "dar a cara".»

[Pbd010310PUBLsócratesna] *The entire article describes the reorganizations that took place in the Douro River jurisdiction and as a result, some of the unclear situations resulting from that.* «Que o Ministério do Ambiente tenha aceite, em 1997, reduzir o seu papel na gestão do Douro a pretexto de um dos muito usos possíveis para o rio, já foi grave. Que, em 1999, tenha reduzido ainda mais o seu papel na gestão do Douro, pior ainda. Mas as suas responsabilidades não desapareceram. (...) A entrega do IND ao Equipamento é (...) encarar apenas a extracção das areias do Douro "como matéria para construção civil", sem atender às implicações que esta actividade tem. (...) "Tudo o que tem a ver com extracções de areia no Douro é da responsabilidade do IND, mas as consequências da exploração em termos hídricos pertencem ao Ministério do Ambiente.»

[Ex010310EXPcastelo] «...quando Centeno da Costa chegou ao sítio, “pouquíssimo tempo” após a queda da ponte, “não era nítido qual seria a entidade a coordenar, uma vez que há várias com competência sobre o rio”. (...) Várias entidades têm competências sobre o rio, desde a Marinha ao Instituto de Navegabilidade do Douro, ou ao Ministério do Ambiente. “Não era claro quem devia assumir o comando” reforça o porta-voz do CEMA»

“Cross-institutional clustering disregard”

[Ex010317EXPareias] «Embora o ministro do Ambiente, (...), tenha afirmado, após o acidente de Entre-os-Rios, que a Direcção Regional do Ambiente do Norte (DRAN) “nada tem a ver com as extracções de inertes”, certo é que, nas competências atribuídas àquela entidade desde 1993, bem como na lei de utilização do domínio hídrico de 1994, consta a fiscalização de inertes nas bacias dos rios nortenhos.» *The entire article develops on existent fuzzy organizational attributions in the Douro river domain.*

Regulatory framework impact

“Controlling Agencies’ empowerment and accountability”

[Ex010310EXPchegou] «No entanto, também neste aspecto existem algumas dificuldades de prova. Sobretudo porque o próprio Estado concede licenças aos areeiros, impondo-lhes quotas de extracção de areias, sem que haja depois um controlo apertado sobre o cumprimento dessas limitações» *The whole article analysis in detail different kinds of responsibility being involved (civil, criminal, political).*

[Ex010310EXPreatório] «Uma inspecção à Direcção de Serviço de Pontes da ex-Junta Autónoma das Estradas (JAE), realizada em 1994 (...) já apontava graves deficiências na situação da fiscalização às estruturas fluviais. (...) O actual sistema de inspecção de pontes no Instituto de Estradas de Portugal (IEP), bem como nos dois outros institutos associados (ICOR e ICERR), mantém-se uma incógnita.»

[Ex010310EXPchegou] «(...) o próprio Regulamento de Segurança e Acções para Estruturas de Edifícios e Pontes (decreto-lei 235/83, de 31 de Maio) não impõe parâmetros temporais de fiscalização, nem sanções para o incumprimento de das normas de conservação e segurança. Uma omissão legislativa que, para alguns juristas pode equiparar este caso (...) onde o Estado foi condenado por não legislar em tempo útil (...)»

[Ex010317EXPareias] «A extracção de areias no Douro está a realizar-se sem o plano, previsto em 1994, para garantir, entre outros aspectos, “a segurança de obras marginais ou de transposição dos leitos”, como sejam as pontes»

[Ex010310EXPquestão] «(...) começou a somar-se a noção de que, entre nós, o estado não dispõe de meios técnicos e de pessoal especializado em número suficiente para garantir a segurança das pontes. (...) a mais elementar função do estado – a segurança das pessoas – não tem condições para ser cumprida»

[Pbd010308PUBLháfalta] «[O presidente do IEP] (...) realçando a desproporção entre os meios do IEP e os “milhares” de estruturas rodoviárias deste tipo para fiscalizar e conservar. “A situação que encontrei era muito difícil e a organização extremamente débil” (...)»

[Pbd010308PUBLnenhuma] «António Martins disse ontem que o IEP nunca vistoriou as fundações por ser tecnicamente “muito complicado”. E porque não há técnicos e não há meios.»

[Pbd010313PUBLlegislação] «A malha legal para a extracção de areias é completamente permissiva e permite, por exemplo, que um empresário a quem foi apesado um batelão fique de fiel depositário do mesmo. “A Direcção Regional de Ambiente do Norte (DRAN, hoje DRAOTN) não tem condições físicas para ter o barco à sua guarda e a Capitania também não quer assumir a responsabilidade”, (...)»

[Ex010310EXPrelatório] «Uma inspecção à Direcção de Serviço de Pontes da ex-Junta Autónoma das Estradas (JAE), realizada em 1994 (...) já apontava graves deficiências na situação da fiscalização às estruturas fluviais. (...) Na altura, a JAE (...) ainda não tinha procedido, entre outros aspectos, à definição de “normas de conservação e inspecção periódica” de pontes, pontões e viadutos. (...) nem sequer tinha actualizado o cadastro das pontes. (...) As falhas nas inspecções, particularmente nas mais antigas, fica [sic] patente na análise dos relatórios anuais da JAE entre 1991 e 1995.»

[Pbd010316PUBLjae] «A JAE não deu seguimento a nenhuma das recomendações, nem em 1986, nem em 1993.»

[Pbd010313PUBLlegislação] «A técnica para escapar à justiça é simples. O areeiro tem duas sociedades: uma assume a propriedade do barco, a outra procede à extracção e venda de inertes. Se o auto de contra-ordenação é levantado à empresa proprietária da embarcação surpreendida, o areeiro esfrega as mãos: diz que tinha alugado o barco à empresa que extrai os inertes (que pertence ao mesmo proprietário), e prova-o com um contrato de aluguer, e o caso acaba arquivado. Se a contra-ordenação é imputada à empresa que extrai a areia, o areeiro deixa seguir o processo até à execução da coima sem contestar. O tribunal vai acabar por descobrir que a empresa não possui qualquer bem em seu nome e, por isso, a coima não pode ser cobrada.»

[Ex010310EXPchegou] *This article develops on the legal issues involved in the investigation about the causes of this disaster both in the roads' and river's domains, resulting from the different kind of responsibility attributed to individuals and organizations.*

"Controlling/controlled interplay"

[Ex010310EXPdequem] «(...) JAE, "reestruturada" em consequência de acusações de corrupção (...)»

[Pbd010306PUBLcadaum] «O contrato impunha algumas restrições, mas os areeiros contornavam-nas facilmente, beneficiando das boas relações que foram alimentando junto de alguns funcionários da Direcção regional de Ambiente do Norte e da Capitania do Douro, cuja fiscalização se pautou sempre por uma gritante debilidade.»

Front and back span

"Power distance"

[Pbd010315PUBLfaltou] « Tentar perceber como foi possível que Castelo de Paiva (...) tenha chegado a este estado de isolamento obriga a recuar uns anos e analisar com atenção o relacionamento (ou, neste caso, a falta dele) entre a autarquia e administração central. Encravado entre o Douro e a serra, com um número de eleitores reduzido (...) O clima de guerrilha constante (...) »

[Pbd010315PUBLpecados] «É exemplar o caso do anterior presidente da Câmara paivense, que enquanto autarca defendeu durante anos a necessidade de uma nova ponte em Entre-os-Rios, e como governador civil (...) a esqueceu, porque a sua agenda passou a ser a agenda do Governo (e do partido). Está aqui toda a diferença entre um responsável político eleito, que tem que prestar contas aos seus concidadãos, e um comissário político que presta contas aos ministros.»

[Pbd010306PUBLponte] «(...), presidente do Instituto de Navegabilidade do Douro (IND), assegura que, desde Setembro de 1997, "não é efectuada qualquer extracção de inertes, legal ou ilegal, nas proximidades da ponte de Entre-os-Rios.»

[Pbd010313PUBLareeiros] «O secretário de Estado da Administração Marítima e Portuária, (...), voltou ontem a garantir que não há extracção ilegal de areias no Douro desde 1997.(...) Mas, em meados de 1999, com base numa relação feita pelo próprio Instituto de Navegabilidade do Douro, havia (...) sete explorações de ilegais de inertes, duas das quais bem próximas da Capitania do Douro e dos serviços regionais do Ministério do Ambiente.»

[Pbd010313PUBLgovernonega] «"Vai-se a Castelo de Paiva e ouve-se à boca cheia dizer que há extracções de areias..."»

"Isolation"

[DN010306PUBLconcelho] «Isolamento. Esta é a palavra mais usada pelos habitantes de Castelo de Paiva para definir a situação deste concelho (...)»

[Pbd010315PUBLcastelo] «Tal como o novo indicador das distâncias virtuais entre as regiões centrais e insulares da União Europeia descobriu que há muito mais quilómetros a separar a Europa rica da periférica, também o índice do poder de compra de um dos seus estados-membros mais pequenos, como é Portugal, revela distâncias bastante superiores à sua dimensão física. Cinfães e Castelo de Paiva, por exemplo, dois concelhos da região com o segundo poder de compra mais baixo do país, ficam a menos de 300 quilómetros de Lisboa e (...) mas parecem outro país(...)»

[Pbd010315PUBLpecados] «A "distância" de que hoje volta a falar-se – e que tanto vale para Castelo de Paiva como para quase todo o país, rural e urbano, litoral e interior – não é tanto a distância física; é a distância política e institucional.»

[Pbd010315PUBLterra] *The contents of the whole article is well defined by its title and sub-title:* «Uma terra de todos e de ninguém. Para resolver os seus assuntos administrativos, os paivenses têm de deslocar-se a sete ou oito cidades diferentes, consoante as competências dos serviços descentralizados»

[Pbd010315PUBLpecados] «Quando (...) a regionalização foi a votos, o concelho de Castelo de Paiva foi motivo de várias reportagens, por ser um exemplo particularmente absurdo da distribuição territorial da chamada administração desconcentrada, isto é, da rede de serviços espalhados pelo país e hierarquicamente dependentes do poder central.»

[Pbd010315PUBLestamosa] «Porque a verdade é que são muitos os esquecidos. Todos os que não têm voz própria, não se organizaram em lobbie, não chegam á televisão, não têm peso eleitoral suficiente (...) escolheu erguer obras que se vissem onde abundam os eleitores. Nesta contabilidade, os pequenos concelhos não pesam.»

[Ex010310EXPcastelo] «(...) Castelo de Paiva faz parte de uma lista de 11 concelhos, referidos num relatório do Serviço Nacional de Protecção Civil (SNPC), como não possuindo este sistema completo. (...) De acordo com especialistas em protecção civil a inexistência (...) atrasou pelo menos 12 horas, a assunção do comando das operações por parte da marinha. Isto é, o início do resgate.»

## Global/local climate changes

[Pbd010306PUBLponte] «A causa imediata para este arrastamento [dos sedimentos] é atribuída à sucessão anormal de caudais intensos. (...) “O normal é haver quinze dias de correntes fortes, este ano já vamos em quatro meses”» *The whole article describes – through specialits’ words – possible outcomes resulting from the severe weather conditions in the area.*

[Ex010310EXPinverno] - «71 mortos, 41 casas destruídas, 495 desalojados...»

## Failure of foresight

“Drifting management”

[Ex010310EXPrelatório] «“Esperámos alguns meses pela decisão e nunca nos chegou qualquer ofício anulando o concurso”, salientou (...) da OZ – a empresa que liderava o consórcio com a proposta classificada em primeiro lugar»

[Pbd010315PUBLsangria] «Nós concorremos, mas o concurso ficou-se por aí. Até hoje ninguém soube mais nada. Com o desmantelamento da JAE, a sua Direcção dos Serviços de Pontes também foi extinta. A um dos novos institutos (...) competiria a tarefa antes incumbida à Direcção dos Serviços de Pontes. “Mas essa tarefa não foi desenvolvida”»

[Pbd010315PUBLgestão] «Os vencedores também forneceriam um manual de inspecção de pontes – algo inexistente -, que estabelecesse os procedimentos a seguir. “Nunca houve na JAE um manual com regras de inspecção.»

[Pbd010310PUBLinstituto] «(...) a divulgação (...) da existência desse relatório [recomendando intervenção nos pilares por se temer que não estivessem calculados para suportar impulso horizontal] levou o ministro Jorge Coelho a pedir ao Instituto das Estradas de Portugal um relatório urgente sobre as razões por que nada havia sucedido depois da vistoria técnica. Ontem foi conhecida a resposta do presidente do Instituto (...): ninguém sabe porque razão, apesar da existência de despachos nesse sentido, o dito relatório nunca foi enviado à Direcção Regional do Ambiente, Delegação do Norte, organismo que depois poderia executar as suas recomendações. Do texto algo confuso em que se misturam datas e protagonistas (...) fica-se porém a saber que, no meio deste processo, o director de Estradas do Porto se aposentou e que um despacho para enviar “já de seguida” em fax fica aparentemente sem execução durante três meses.»

"Communication/Information difficulties"

[Pbd010310PUBLtribunal] «A decisão afigura-se complexa e deverá vir também a ser condicionada pela natureza dos três institutos: se têm uma estrutura exclusivamente empresarial ou de índole administrativa.»

[Pbd010306PUBLpressões] «A relação entre Jorge Coelho e António Martins, (...) foram sempre difíceis: convidado para o cargo por Guterres, António Martins prefere, em geral, despachar directamente com o primeiro-ministro a prestar contas à sua tutela, (...).»

[Pbd010306PUBLvisita] «reiterou (...) o gabinete do ex-secretário de Estado das Obras Públicas, (...): "Não havia qualquer informação sobre o risco de ruína da ponte.»

[Pbd010305PUBLirrespons] «(...) estabeleceu-se uma verdadeira conspiração de silêncio, onde se associam, coniventes, antigos e actuais responsáveis técnicos e políticos pelos organismos públicos que promoveram, dirigiram, controlaram ou executaram essas obras.»

[Ex010317EXPLições] *This article makes* «(...) o ponto da situação de acidentes recentes em Portugal que têm questões ainda por resolver.»

[Pbd010306PUBLdesastre] «Logo após o acidente, inesperado, apesar de insistentes denúncias quanto ao mau estado da ponte, (...)»

[Pbd010310PUBLinstituto] «António José da Silva, de Rio Tinto, escreveu em Setembro ao "ministro das obras públicas" alertando para a retirada de areias no Douro, dizendo que esta poderia estar a minar o apoio dos pilares da ponte de Entre-os-Rios. (...) Foi esta carta que motivou uma visita ao local de técnicos da Direcção de Estradas do Porto, o [*sic*] qual deu origem ao relatório em que se recomendava uma intervenção no local (...)»

[Pbd010315PUBLverdade] «No dia 29 de Dezembro de 1986, a empresa responsável pelos trabalhos, a ETEC, enviou um relatório à Junta, sugerindo a reparação das sapatas dos pilares (...), para precaver um possível descalçamento das fundações. Por pressão dos autarcas locais, a JAE passou a equacionar a possibilidade de construir uma ponte nova, razão pela qual terá desistido de dar seguimento às recomendações feitas pela ETEC. No entanto, em 1990, procedeu a alguns melhoramentos na estrutura metálica da ponte e no seu pavimento, e voltou a esquecer as fundações. A ponte ainda aguentou 15 anos»

[Pbd010316PUBLjae] «A JAE não deu seguimento a nenhuma das ecomendações, nem em 1986, nem em 1993. Em 1986, adiou uma intervenção na ponte, porque passou a equacionar o alargamento do tabuleiro. Mas o tabuleiro não foi alargado, porque, de acordo com a recomendação da ETEC, os custos eram elevados – o alargamento exigia uma intervenção aprofunda nas fundações. Posteriormente, a Junta avançou para a construção de uma ponte nova – que continua por fazer, – e as reparações na velha foram, de novo, adiadas.»

### Boomerang Management

#### "Development of backfire strategies"

[Pbd010314PUBLiep] «"Há uma enormidade de obras de obras que não é vista há muito tempo. Os corpos directores queixavam-se de que não tinham orçamento para fazer face a operações de manutenção e reforço de obras-de-arte" (...) "Esse trabalho não era feito praticamente há anos, porque não havia verbas. Os técnicos não saíam da secretária, porque não pagavam as estadias nem as deslocações."»

[Pbd010306PUBLinvasão] «E, no entanto um dos objectivos para que foram criados [os três institutos provenientes da JAE] era o de "segurarem" bons engenheiros em organismos do Estado com ordenados mais altos (cerca do dobro) dos que consegue pagar a administração pública nos lugares equivalentes. O problema é que para acederem aos novos vencimentos (...) os técnicos em causa tinham de abdicar da Caixa Geral de Aposentações – ou seja, da reforma integral. A maior parte não quis: e uns, regra geral os mais velhos, pediram reforma antecipada; outros rumaram às empresas privadas.»

[Pbd010313PUBLgovernoneg] «O Governo garantiu ontem a legalidade da extracção de areias em Entre-os-Rios. (...) Todos os dias são feitas fiscalizações, garante o secretário de estado (...). "Há relatórios diários, a que os deputados poderão ter acesso (...)"»

[Pbd010315PUBLestado] «Hoje o Estado recebe uma avultada "comissão" (quase um milhão de contos só no ano passado) das extracções legais e continua a não querer saber das outras: das que os mesmos ou outros areeiros fazem nas margens do rio, e das que são feitas durante a noite em zonas não licenciadas. E não se mostra capaz de evitar que extracções totalmente ilegais continuem a prosperar mais a montante.»

[Pbd010308PUBLdeposito] «Com a criação do Instituto de Navegabilidade do Douro, em 1997, os seus responsáveis procuraram colocar alguma ordem no sector de extracção de areias. Mas, em vez de interditar o que estava ilegal, passaram a exigir o pagamento de uma licença de utilização.»

[Pbd010313PUBLnegócio] «Mas apesar de continuarem a atropelar as regras da concessão, os areeiros já não dependem em exclusividade da actividade extractiva. (...) Estão todos milionários. Ganharam tanto dinheiro que aceitaram sem protestos que, em apenas dois anos, as contrapartidas a pagar ao Estado por cada metro cúbico de areia extraído tivessem aumentado quase oito vezes. Em 1997, as areias do Douro rendiam ao Estado cerca de 120 mil contos. No ano passado, o IND recebeu cerca de 850 mil contos dos areeiros. Um verdadeiro negócio da China. Para os areeiros e para o estado.»

“Imposition of artificial fixes”

[Pbd010306PUBLinvasão] «Por regra, quem entrou a substituí-los [aos técnicos que saíram] foram jovens quadros do Partido (...). Um exemplo: (...), entrou directamente para um lugar equiparado a director de serviços. Enquanto na função pública só lá poderia chegar após uma série de anos, segundo as leis orgânicas dos novos institutos a administração respectiva pode admitir (...)»

[Pbd010315PUBLgestão] «(...) 19 técnicos para 3500 obras-de-arte é pouco para garantir as vistorias e manutenção (...) A não ser que se recorresse aos serviços de empresas privadas, que fizessem o levantamento das obras-de-arte, do estado de conservação e das reparações necessárias. O concurso público para a gestão das obras-de-arte foi lançado (...) Às empresas e consórcios privados era pedido que (...)»

[Pbd010315PUBLverdade] «As filmagens foram realizadas (...) no âmbito de uma inspecção pedida pela ex-Junta Autónoma das Estradas para estudar o possível reforço e alargamento da ponte. No dia (...) a empresa responsável pelos trabalhos, a ETEC, enviou um relatório à Junta, (...)»

[Pbd010316PUBLjae] «(...) como havia sido recomendado em 1986 por uma empresa de sondagens que, nesse ano, fez uma vistoria às fundações. Realizada por mergulhadores, essa vistoria – cujo vídeo foi transmitido na terça-feira pela SIC (...)»

“Acceptance of facilitating practices”

[Pbd010308PUBLnenhuma] «A prática actual nos institutos em que a JAE se desmembrou é a de fiscalizarem as estradas, as pontes e os viadutos, construídos e em construção, só pelo seu “aspecto”. Com apenas 19 engenheiros para fiscalizarem 3500 pontes espalhadas pelo território e para avaliarem os projectos das que se querem construir, é evidente que as inspecções não podem ser de outro tipo.»

[Pbd010313PUBLnegócio] «O controlo dos volumes de areia extraídos é feito à distância por um funcionário do IND, com base na capacidade útil dos barcos envolvidos. O método é tudo menos infalível, mas o director do IND acredita que, se há fugas, elas são mínimas.»

[Ex010317EXPareias] «(...) a lei obriga que as direcções regionais do ambiente, incluindo a do Norte, realizem estudos de impacte ambiental para extracções superiores a 150 mil metros cúbicos por ano. Ora, de acordo com os dados do Instituto de navegabilidade do Douro (IND) foram autorizados, durante o ano de 2000, cerca de 320 mil metros cúbicos, que deram uma receita superior a 500 mim contos. “E ainda haverá muita areia que é extraída ilegalmente” (...) Tem sido, contudo, entendimento do Ministério do Ambiente que as extracções de inertes sejam contabilizadas uma a uma – e não em conjunto – pelo que não tem sido feita qualquer exigência para a elaboração de estudos prévios»

“Enabling non-sensemaking”

[Pbd010314PUBLiep] «Na altura da extinção da JAE, a sangria dos quadros da Direcção dos Serviços de Pontes já estava em marcha (...) “(...) sobrevivia mal. Estrebuchava para não se afundar com a sangria. Foi-se tudo embora, até o director. As pessoas estavam desmotivadas, cada um queria fazer o menos possível”»

Organizational disaster synergy

“Error prone organizations’ conjunction”

[Pbd010315PUBLmais] «O presidente do Instituto de Conservação e Exploração da Rede Rodoviária (ICERR) (...) colocou anteontem o lugar à disposição (...). Na carta enviada ao ministro (...) aproveitou ainda para ressaltar (...) que o ICERR “não tem qualquer responsabilidade na conservação de pontes”, nos termos de uma circular de 22-9-99 do instituto das Estradas de Portugal (IEP), que endossou essa atribuição ao instituto da Construção Rodoviária (ICOR).»

[Pbd010307PUBLconservaç] «Pela sua natureza, deveria ter sido este último [ICERR] a ficar com a competência em matéria de manutenção de obras de arte mas não foi isso que aconteceu. Logo após a criação dos três institutos, o então presidente do Conselho de Administração do IEP (...) (que, por inerência, também presidia aos restantes), emitiu uma circular atribuindo ao ICOR a responsabilidade do lançamento de novas vias de comunicação, (assegurada pela JAE construções), complementada com a Direcção do Serviço de Pontes, e, portanto com os respectivos técnicos. No entanto a prática parece ter subvertido este preceito, pelo menos no caso da ponte Hintze Ribeiro. Quando foi preciso mandar um técnico visitá-la (...) foi o ICERR que

fez avançar para o terreno um dos seus quatro técnicos de pontes, dos 19 existentes nos três institutos.»

[Ex010317EX Pareias] *Under the label «poderes confusos»: «Com efeito, no que diz respeito à extracção de areias, de acordo com as suas competências legais, o IND apenas deveria dar um parecer sobre “os actos que, incidindo na via navegável, possam interferir com a navegabilidade”. Mas, no caso dos licenciamentos dos areeiros - que deveriam ser passados pela DRAN – o parecer nem sequer é vinculativo. No entanto, o IND passou a ser a entidade emitente das licenças dos areeiros, pese embora a inexistência de qualquer norma legal»*

“Nature/Organizations’ interplay”

[Pbd010307PUBL inverno] *This article cites several cases in Portugal, between 2000 and the year of the disaster, where man’s construction and bad weather conditions had been closely linked in the production of unwanted outcomes.*

[Pbd010308PUBL ficar] *«À angústia acresce a raiva, por não se tratar, (...) “de um drama natural, mas de dimensões que têm a ver com erro humano»*