Original Article

Managing risks through ISO 31000: A critical analysis

Carole Lalonde* and Olivier Boiral
Department of Management, Université Laval, 2325 Rue de la Terrasse, Pavillon Palasis Prince, Quebec City, QC, Canada G1K 7P4.
E-mails: carole.lalonde@mng.ulaval.ca; olivier.boiral@mng.ulaval.ca

*Corresponding author.

Abstract Managing risks is a strategic challenge for organizations, which must face threats increasingly complex and diverse. Introduced in 2009, the ISO 31000 standard is intended to help organizations to manage in a systematic and comprehensive manner diverse types of risk by offering a universal framework 'to assist the organization to integrate risk management into its overall management system' (ISO, 2009a, p. 9). This article aims to shed light on the contributions of this standard, while emphasizing the pitfalls that may arise from misconceptions regarding ISO 31000 and its use as a tool to control risks. Although the ISO 31000 standard has effectively integrated the principles and practices considered most effective by many experts and researchers in the field, the experience feedback from examples of organizational crises in various sectors should lead managers to question *how* they will integrate it in their organizational strategy. The conclusion suggests that risk management should be seen as a practice-based approach, a strategy that managers *do* and not a strategy that managers *have*. In this regard, managers must question their own assumptions in the implementation of such a standard, take into account the specificities of their internal and external organizational environment and remain vigilant in its monitoring.
Risk Management (2012) **14,** 272–300. doi:10.1057/rm.2012.9

Keywords: risk management; ISO standard; crises; strategy as practice

Introduction

Addressing and managing risk are major challenges for leaders and a key component of strategic management (Baird and Thomas, 1985; Lerbinger, 1997; Pearson and Clair, 1998; Ruefli *et al*, 1999;

Power, 2004; Smith and Fischbacher, 2009; Boholm, 2010; Herbane, 2010; Boholm *et al*, 2012). Uncertainty and risk-taking are inherent in most policy decisions, particularly when they have major long-term impacts. Whether they are considering launching a new product, introducing a new process or new technology, acquiring another business, constructing a new factory or establishing policies or regulations affecting management, leaders must assess not only the potential benefits of these measures, but also the risks associated with them. Organizations and society in general are thus facing new systemic risks that have arisen for the most part in the second half of the twenty-first century (Peretti-Watel, 2001; Gilbert, 2007; Quarantelli *et al*, 2007; Marshall and Picou, 2008). Among these new risks are major technological dangers (for example, Bhopal, Chernobyl, Three Mile Island, AZF-Toulouse), food-borne diseases (for example, mad cow disease, listeriosis), health threats (for example, the contaminated blood crisis, SARS, AIDS, H1N1) and environmental risks (for example, global warming, accumulation of pollutants, thinning of the ozone layer). Indeed, industrialized societies are becoming increasingly high risk, which many now consider as 'risk societies' (Giddens, 1991; Beck, 1992; Lupton, 1999; Boin and Lagadec, 2000; Gephart *et al*, 2009). While making use of expertise gained from the management of more traditional risks, organizations are encouraged to adopt management models that take into account the increasing diversity and complexity of risks (Quarantelli, 1988; Perry and Lindell, 2003; McEntire and Myers, 2004; Raz and Hillson, 2005; Boholm, 2010) and to imagine a new corporate governance (Boholm *et al*, 2012) in order to preserve safety and quality of life for the society. Now the dilemma for managers is to determine which model is best suited to meet the contemporary requirements of organizations for risk management.

The aim of this article is to examine the relevance of the ISO 31000 standard in improving risk management practices, with an emphasis on the limitations and myths that may arise within organizations by a formal approach based on a symbolic use of this type of standard. As shown by the neo-institutional approach on standardization, many organizations tend to adopt ISO standards quite superficially in order to reinforce their social legitimacy through the implementation of rational and reassuring frameworks (Boiral, 2003, 2007; Christmann and Taylor, 2006). This type of symbolic implementation is too often mechanistic, ceremonial and disconnected from internal practices (Meyer and Rowan, 1977; Grandy and Mills, 2004). From this perspective, whatever the relevance of ISO 31000 propositions, their application within organizations may be perfunctory and project an idealized image of risk management. A review of the literature on risk and crisis management and an analysis of various crises will help shine a spotlight on the claimed benefits and the paradoxes arising from a mechanistic application of management framework such as the one proposed by ISO 31000. In line with Boholm (2010), Corvellec (2010), Gherardi and Nicolini (2000), Jarzabkowski and Spee (2009) and

Whittington (2006), it is suggested that leaders and managers should take the turn from an approach essentially centered on formal strategic planning (strategy as something an organization formally *has*) to an approach more focused on reflexive strategic praxis (strategy as something an organization really *do*) in the field of risk management. The proposals set out in the standard will be reviewed, with reference to research conducted by recognized researchers in the field. The article will present the advantages and limits in the application of the standard and propose some recommendations to managers who are planning to integrate a risk management process into the overall strategy of their organization. In this sense, the article aims to stimulate thinking among managers and leaders as well as providing a pre-use warning before implementation of a standard such as ISO 31000.

ISO 31000: A Classical Model

One of the main objectives set by the ISO 31000 standard is to continually improve risk management in organizations based on a generic model that is intended to adapt to a wide variety of risks (Leitch, 2010; Purdy, 2010). In this section, the main foundations and principles of ISO 31000 will be presented. This presentation of ISO 31000 is also an opportunity to review our conceptions of risk (Krimsky and Golding, 1992; Thompson and Dean, 1996; Lupton, 1999; Rochlin, 1999) – positivist and constructivist – that have developed historically and which are at the basis of many models in risk management.

A generic framework for multiple risk management

Like most other ISO management standards, ISO 31000 provides a structured framework intended to meet the needs of any type of organization or situation. In order to be applied to such a vast diversity of activities and risks, the approach proposed in the standard is fundamentally intended to be generic and rational. According to the standard, effective risk management results from the application of a very systematic and structured management process. The criteria for risk assessment proposed in ISO 31000 largely spring from this probabilistic logic, taking into account many aspects, the most common of which are: the nature of the causes and consequences; measurement of the probability of occurrence; estimation of the duration of the potential impacts; the threshold of acceptable risk; the level at which appropriate measures should be taken; and the tendency toward increased entropy and disorder which results from a combination of risks.

According to the standard, each organization should identify all the risk – the nature of the risks, the circumstances or events promoting their occurrence, the potential consequences and so on – in terms of the organization's objectives for achieving its mission. A list of risks should be established and each

risk should be assessed with regard to the available information. The presence or absence of expert consensus about a given risk should also be highlighted.

After the identification and analysis of risks, the organization should determine those risks for which explicit measures will be taken and those which will be accepted as residual risk. The choice of how each risk is treated is based on the anticipated efficacy of the chosen measures, the legal or regulatory requirements the organization is subject to, the values and preferences of the stakeholders and a cost-benefit analysis. The choice of measures to be taken should be discussed and communicated to various parties, and their efficacy should be periodically evaluated. When resources are scarce, an order of priority should be established and should reflect the costs resulting from implementation of the risk treatment measures, compared with the gains resulting from not taking such measures.

The entire process should be documented and activities recorded in order to maintain an overview of decision-making and respond to legal or regulatory requirements, if applicable. Finally, a periodic review of the entire process of identifying, analyzing and addressing risk should be conducted to reflect changes in the external and internal environments, as well as the emergence of new risks or new methods of managing them. The persons responsible for reviewing and monitoring the process should be clearly designated.

In general, the ISO 31000 standard, like other generic management standards of this type, is based on procedural logic and on the classical principles of 'plan, organize, direct, control'. These principles are based on a conception of risk as an aspect of management that can be quite clearly defined, measured and managed using basic management practices that have already proven their worth in other areas. Again according to the standard, implementation of these principles should lead to a process of continual improvement of the risk management system. The latter should be based on measurable indicators, integrated into the company's overall performance assessment process and be applied, as much as possible, to all the organization's various divisions and departments.

A contribution to building high reliability organizations

The general principles underlying the ISO 31000 risk management standard have been widely disseminated in the literature, particularly by authors interested in crisis planning and prevention (Table 1).

For instance, according to Perry and Lindell (2003), the assessment of an organization's preparedness is based on four criteria: an evaluation of risks (vulnerability assessment); an evaluation of the ability of the organization and the community to cope with crises (capacity assessment); the training and retention of qualified personnel; and the establishment of a flexible system that can be deployed quickly when a crisis arises. These aspects are clearly

Table 1: Guiding principles from the literature and ISO 31000 recommendations

Guiding principles for planning and prevention[a]	*ISO 31000:2009, Geneva*[b]
1. Develop a plan based on the most current knowledge, on two levels: (a) risk assessment (b) human behavior.	There should be an organization-wide plan to ensure that risk management policy is implemented and that risk management is embedded in all of the organization's practices and processes. The risk management plan can be integrated into other organizational plans, such as a strategic plan (p. 11). The purpose of risk treatment plans is to document how the chosen treatment options will be implemented (p. 20). Risk management is based on the best available information (p. 7). Risk management takes human and cultural factors into account (p. 8).
2. Develop tailored responses and act quickly but well, ie, take appropriate action.	Risk management should help avoid an over-reaction to risk that can unnecessarily prevent legitimate activity and/or seriously distort resource allocation (p. vi).
3. Be flexible in the application of the plan and adjust to circumstances; avoid getting lost in the details.	Organizations should adapt the components of the framework to their specific needs (p. 9). Risk management is aligned with the organization's external and internal context and risk profile (p. 16). 'Risk analysis can be undertaken with varying degrees of detail, depending on the risk, the purpose of the analysis, and the information, data and resources available. Analysis can be qualitative, semi-quantitative or quantitative, or a combination of these, depending on the circumstances' (p. 18).
4. Coordinate with other managers and responders, both internal and external; know what others are responsible for; do not act alone or in isolation.	Communication and consultation with internal and external stakeholders as far as necessary should take place at each stage of the risk management process (p. 8).
5. Develop a comprehensive, multiple-risk view.	All decision-making within the organization, whatever the level of importance and significance, involves the explicit consideration of risks and the application of risk management to some appropriate degree. (…) [S]oundly based risk management is seen within the organization as providing the basis for effective governance' (p. 23). Risk assessment is the overall process of risk identification, risk analysis and risk evaluation (p. 17). Whether combinations of multiple risks should be taken into account and, if so, how and which combinations should be considered (p. 17).
6. Train personnel and educate the public.	The International Standard is intended to be used by (…) developers of standards, guides, procedures, and codes of practice that in whole or in part set out how risk is to be managed within the specific context of their documents (p. vi).

Table 1 *continued*

Guiding principles for planning and prevention[a]	*ISO 31000:2009, Geneva*[b]
7. Promote the development of personal contacts through simulation exercises.	After identifying what might happen, it is necessary to consider possible causes and scenarios that show what consequences may occur. All significant causes should be considered (p. 11).
8. Take into account the views and expectations of the stakeholders.	Consultation is a two-way process of informed communication between an organization and its stakeholders on an issue prior to making a decision or determining a direction on that issue (p. 4). The organization should develop and implement a plan as to how it will communicate with external stakeholders (p. 12). Communication and consultation with external and internal stakeholders should take place during all stages of the risk management process (p. 14).
9. Periodically review the plan and monitor the process.	Both monitoring and review should be a planned part of the risk management process and involve regular checking or surveillance (p. 20). The results of monitoring and review should be recorded and eternally and internally reported as appropriate, and should also be used as an input to the review of the risk management framework (p. 20).
10. Make sure to invest in strengthening the organization's preparedness to deal with crises through an ongoing process of prioritization.	The purpose of risk evaluation is to assist in making decisions, based on the outcomes of risk analysis, about which risks need treatment and the priority for treatment implementation (p. 18). The treatment plan should identify the priority order in which individual risk treatments should be implemented (p. 19). Risk management helps decision makers make informed choices, prioritize actions and distinguish among alternative courses of action (p. 7).
11. Refine the application of the plan depending on the circumstances.	Risk management is dynamic, iterative and responsive to change (p. 8). The context of the risk management process will vary according to the needs of an organization (p. 16). Review and improve the risk management policy and framework periodically and in response to an event or change in circumstances (p. 11). 'The organization should identify sources of risk, areas of impacts, events (including changes in circumstances) and their causes and their potential consequences (p. 17).

[a]*Sources*: Dynes (1983, 1994), Quarantelli (1988), Perry and Lindell (2003), McEntire and Myers (2004), Alexander (2005), McConnell and Drennan (2006). For a review, refer to Lalonde (2011).
[b]Secrétariat of ISO 31000 (2009a, b).

covered in the ISO 31000 standard, whose recommendations help users address the main operational requirements of risk management, from risk assessment to integration of risk treatment into the organization's structure and practices.

The recommendations from the literature define virtually the entire framework of risk management in the same terms: defining management's mandate and commitment to adopting a risk management framework, that is, the equivalent of a mission statement (Weick and Suncliffe, 2007); developing a risk management plan or policy, including an analysis of the external and internal environment (Alexander, 2005); defining of the principles and objectives that the plan will be based on (Lerbinger, 1997); identifying mechanisms of accountability (Perry and Lindell, 2003); identifying the resources to be allocated to implementing the plan or policy, and how communication will be handled both internally and externally (Quarantelli, 1988); determining a process by which the plan or policy will be implemented, monitored and updated (Perry and Lindell, 2003; McConnell and Drennan, 2006).

The definition of such a framework also brings together several general principles used to describe high reliability organizations. According to its proponents, the HRO (High Reliability Organizations) model has proven itself in various sectors (Laporte, 1994; Rochlin, 1996; Weick and Suncliffe, 2007), particularly in high-security industries (Leveson *et al*, 2009) such as aerospace, air traffic control, aircraft carriers in US naval bases and power plant commissioning (Rochlin *et al*, 1987). Senior management's commitment to promoting a culture of safety and their concern for the continual improvement of risk management plans and processes are two principles set out in the HRO model that are in accord with both the spirit and letter of the ISO 31000 standard. Several other HRO principles are however not reiterated, at least not explicitly, in the ISO 31000 standard, in particular the importance of a staff development program and establishing a system to acknowledge employees who detect risks early. This point will be analyzed further in the next section.

An opportunity to revisit risk management models

Initially, it was the insurance industry that introduced the concept of risk as a means of reducing uncertainty in calculating premiums (Peretti-Watel, 2001). In this view, risk is calculated in monetary terms, by multiplying the anticipated damages by the probability of the event occurring. As shown by Lupton (1999), with the rise of the welfare state, the twentieth century witnessed a progressive increase in the number of hazards classified as risks, and therefore insurable. Risk as measurable quantity has thus become the preferred tool of risk assessment experts.[1]

The most common definition of risk is based on a probabilistic approach (Perret *et al*, 2005; Gralepois, 2008). Bernard *et al* (2002) define risk as 'the

probability of an event occurring and its impact on an entity, whether the impact is financial, environmental, physical or on the health and wellbeing of humans'. The risk is measured by the probability and the size of the impact of the event. Expressed mathematically, risk equals anticipated damages multiplied by their probability. For risk prevention and management professionals, the goal is to find occurrence criteria and to determine the probability of the event (Gralepois, 2008). When the result of this equation is a low value, because either the probability of the event or the severity of the damages is low, the risk is considered negligible. It is arbitrarily defined without societal debate and classified as 'residual risk'. In addition, it is often considered an 'acceptable' risk, that is, the level of risk that society is prepared to tolerate from an economic point of view, taking into account the current knowledge about the risks in a given situation.[2]

A growing number of studies deplore the tendency of managers to limit risk management to this classical positivist model rather than regarding risk management as an ongoing and socially constructed process (Beck, 1992; Perry and Lindell, 2003; McEntire and Myers, 2004; Hansson, 2005). Several studies also emphasize that the concept of risk is a construct that is not directly observable and can therefore have multiple meanings (Duclos, 1987; Rochlin, 1999; Bernard *et al*, 2002; Galland, 2003). According to Perret *et al* (2005), reality provides a subtle and complex mixture of clues, signs, information, correlations and partial evidence that do not fit easily into the classical definition of risk. There is thus always an element of subjectivity in the definition of risk (Malenfant, 2009), leading Short (1984) to speak in terms of risks to the social fabric. Douglas and Widalvsky (1982) similarly argue that the concept of risk is strongly influenced by culture and distinguished four cultural types, each with a different attitude toward risk: the hierarchical type (risk-averse), the individualist type (risk-taking), the sectarian type (risks as object of social causes) and the marginal type (distrustful attitude).

Moreover, according to a number of authors, risk management can no longer take the same form as previously, because the potential risks to which our societies are exposed have changed radically and can no longer be understood under a restrictive probabilistic definition of risk (Lupton, 1999; Boin and Lagadec, 2000; Hart *et al*, 2001; Quarantelli, 2001; Robert and Lajtha, 2002; Galland, 2003; Hansson, 2005; Perret *et al*, 2005; Denis-Rémis, 2006; Boin, 2009; Power, 2009; Smith and Fischbacher, 2009). For instance, many authors (Noji, 2001; Salehi and Ali, 2006; Monterrubio, 2010) point out the global impact of the resurgence of infectious diseases such as SARS and H1N1 and the necessity to rethink risk management on a global rather than a local scale. Indeed, the apparent proliferation of new transboundary risks is linked to the phenomenon of increasingly tight coupling between systems (Linnerooth-Bayer *et al*, 2001; Perrow, 1999; Boin and Lagadec, 2000; Smith and Fischbacher, 2009; Arvai and Froschauer, 2010), to the point that a breakdown in any one system eventually

has an impact all the connected systems (Shrivastava, 1994; Noji, 2001; Power, 2009). For example, the airline industry is obliged to constantly seek increasingly sophisticated technologies in an effort to ensure security in the context of our ever more crowded air space. A similar phenomenon has been seen in the food industry, which in recent years has faced major problems of food contamination as a result of changes in procedures (for example, the cases of mad cow disease in the United Kingdom) or in how regulations are enforced (for example, the listeriosis outbreak in Canada). These types of problems are major threats that can have strategic impacts for the companies involved, including production stoppages, suspension of activities, product recalls, recourse to only somewhat reliable product tracing methods, and the destruction of the suspected sources of contamination (livestock, consumer products, and so on).

Despite these observations, many models of risk management continue to rely on a probabilistic definition of risk, while recognizing that the views and perceptions of various stakeholders with regard to the risk in question must be taken into account. Many researchers (Séguin, 2005; Gilbert, 2007; Marshall and Picou, 2008; Corvellec, 2009; Boholm *et al*, 2012) lament this tendency to rely on a traditional model based on technical and scientific rationality as the dominant framework in risk management, while businesses and governments seem to be in search of new approaches to respond to increasingly complex challenges.

According to Purdy (2010), the specifications set out in the ISO 31000 manuals avoid this pitfall:

- by adopting a consensual definition of risk – *the effect of uncertainty on objectives*;
- by incorporating a stage of both internal and external consultation in the process of identifying risks and their management;
- by proposing various risk assessment techniques, including inductive reasoning techniques such as HAZOP, brainstorming and the Delphi method, to name but a few.

In that perspective, the ISO 31000 standard implicitly acknowledges that the process of risk assessment involves the art of combining the positivist and constructivist views of risk (Krimsky and Golding, 1992; Thompson and Dean, 1996; Rochlin, 1999).

Leitch (2010) is more critical and considers that the terminology used in ISO 31000 is too vague or ambiguous and offers minor guidance to managers to the point that it 'leads to illogical decisions and is impossible to comply with'. He laments that the definition of risk provided in Secrétariat of ISO 31000 (2009a, b, c) is unclear and not enough mathematically based.

In line with researchers such as Weick and Suncliffe (2007), Slovic (1999), Renn (1998), and Hansson (2005), it would be wise for managers to not let the process's apparent rationality make them forget that there is inevitably an

element of subjectivity in any process, stemming from the perceptions and expectations of the diverse actors concerned with risks in any given set of social circumstances. For instance, in his analysis of the mad cow disease, Lanska (1998) believes that the British government's strategy was based on a perception of risk which differed from that of society at large and that conveyed in the media. Lanska also observes that British citizens have harshly judged their government for not including public opinion as well as 'expert' advice in the decision-making process, to such an extent that the government's position was seen as promoting economic interests at the expense of public health. Séguin (2005) suggests that this indeterminacy of knowledge calls into question the traditional definition of risk based on a causal model of occurrence.

Another example of this inherent subjectivity in the process of risk assessment can be found in the 2003 heat wave in France; before the crisis, many experts had issued recommendations concerning the dangers linked to excessive heat but these risks were not included in the final version of the emergency planning due to lack of consensus among public health agencies about its perceived significance. In fact, '[…] what emerges clearly from the hearings of the commission of inquiry is that the consequences of intense heat on the population had not been fully analyzed or anticipated by the public health and safety services prior to last summer's tragic episode. Several ministers agreed on this point' (Poumadère *et al*, 2005).

In the light of these examples, the complementarity between the positivist and constructivist approaches to risk should be acknowledged by organizational members. The arrival of the ISO 31000 standard is a good opportunity to revisit basic assumptions regarding risk management, particularly when times will come for its implementation (Hansson, 2005).

Advantages and Limits of ISO 31000

Based on a literature review (Lalonde, 2012) and a thorough analysis of the principles and guidelines defined in the international standard ISO 31000 (2009a), this section highlights the main advantages and limits of a risk management framework such as ISO 31000. As this standard has not yet been implemented, the analysis is primarily intended to raise questions and issues in a preventive purpose for leaders and managers interested in the implementation of a risk management system.

Advantages related to the systematic and structured process proposed

Risk management approaches, when well designed, should offer many advantages and increase the efficacy of an organization's actions (Quarantelli, 1988; Mitroff and Alpasian, 2003; Perry and Lindell, 2003; Lalonde, 2007). On the one hand, risk management facilitates identification of major risks and

implementation of appropriate measures for their prevention or effective management (Raz and Hillson, 2005). On the other, it promotes increased awareness of risks and encourages the organization to take risks into account (Scheytt *et al*, 2006). The ISO 31000 standard quite clearly defines the main responsibilities of organizations in this regard, including establishing a policy on risk management, communicating its beneficial effects to the various stakeholders, and ensuring that sufficient resources are in place (for an integrated view on this comprehensive framework, see Figure 2, ISO, 2009a, p. 9). While it is difficult to measure the claimed benefits of the standard before its implementation, the systematic and comprehensive view presented in the documentation relating to ISO 31000 should help to avoid major pitfalls, particularly in terms of planning for crisis prevention and management measures. In this perspective, the management framework proposed by ISO 31000 provides several advantages for organizations and managers.

Firstly, the comprehensive and multiple-risk approach underlying this management framework (p. 17) tends to reinforce the commitment of corporate leaders in advance of their decision-making processes (p. 9). Thus, the standard does not simply address specific risks for the benefit of risk management specialists (p. 8); rather it proposes a comprehensive approach that involves making leaders and decision-makers accountable (p. 11). They are called on to become aware of risks that may previously have been overlooked or ignored, to evaluate and prioritize various types of risks, and to put the necessary resources in place to manage the identified risks (p. 11).

Secondly, the proposed classical risk management framework can easily be integrated into the organization's existing practices (p. 11). For example, companies with ISO 9001 and ISO 14001 certification could incorporate into their management system some of the ISO 31000 suggestions that are shared with the ISO management standards, such as the definition of goals and plans, mechanisms of communication and reporting, monitoring performance indicators, and a continual improvement approach.

Thirdly, ISO 31000 suggests principles and guidelines on how to manage the complex issues that are often poorly understood or dealt with too narrowly. For example, the standard shows how to manage risk as a source of added value for the company (p. 7, improvement of performance, human health and safety, public acceptance, protecting the corporate image, better management of workplace health and safety, regulatory compliance, and so on).

Finally, despite its formal and generic nature, the standard emphasizes the importance of adapting the risk management system to the specific context of each organization, including its cultural and political characteristics, stakeholders' expectations and the organizational culture (pp. 1, 8, 9). In general, the standard does not focus on specific risk management techniques, but rather on how to address these issues holistically through established planning and management practices, taking into account the organization's particular context (pp. 10, 15).

Limits Related to Strategizing

Results from retrospective analysis of crises

A standard such as ISO 31000 should serve to deter, or initially foresee, the most recurrent problems noted and documented in the retrospective analyses of several crises by numerous committees of experts and researchers (Lalonde, 2012). Yet, research and reviews of a number of recent crises, of all types (major industrial risks, food processing, public health, natural catastrophes in both the private and public sectors, and so on) tend to show that several basic principles underlying the ISO 31000 standard are unfortunately not, or are poorly, integrated into the strategic practices of organizations (Pauchant, 1990; Pearson and Mitroff, 1993; Wooten and James, 2008). Table 2 summarizes the main deficiencies identified in various cases documented by researchers in risk management and crisis management.

The main issue here seems to arise not so much on the relevance of the standard itself but rather concerns the modalities of implementation in organizations (Corvellec, 2009; Deverell and Olsson, 2010; Boholm *et al*, 2012). In this regard, it seems possible to identify some real-case scenarios:

- organizations that lack a system of risk management;
- organizations that develop inadequate risk management systems or do not use them efficiently or properly;
- organizations that are too small and more generally, companies that lack resources to invest in sophisticated risk management system;
- organizations that do not manage to integrate risk management into their organizational work/praxis;
- organizations that adopt risk management system as a rational ritual that provides the company with a false feeling of safety and thereby raises their overall risk level;
- organizations that do not invest in human capital.

The next section will examine each of these cases in more detail. This analysis will highlight the main features of the strategy-as-practice perspective (Whittington, 2006; Jarzabkowski and Spee, 2009) which are: the role of practitioners of the strategy; their interconnectivity; their situated practice; their discursive practices.

Organizations that lack risk management

For instance, in the case of the Bhopal disaster (Shrivastava, 1987, 1994; Sen and Egelhoff, 1991; Weick, 2010), most of the basic risk management measures were neglected. In addition to the management's and the surrounding population's ignorance of the risks, there were essentially no risk management

Table 2: Deficiencies in risk management (before crises): A synthesis of various cases documented in research

Cases studied in literature	*Deficiencies in risk management*
Production lines/major industrial risks Bhopal (Shrivastava, 1987, 1994; Sen and Egelhoff, 1991; Weick 2010); Exxon-Valdez (Harrald *et al*, 1990); AZF Toulouse (Dechy *et al*, 2004)	Despite experts' warning of the dangers, these cases illustrate the failure to conform to recommendations of risk management inspection audits, a slackening of basic security regulations and insufficient attention to providing adequate operator training.
Food processing Mad cow disease (Lanska, 1998; Séguin, 2005)	Although the causes are still not well known, changes in the slaughtering processes might have contributed to the emergence of new risks. The slowness of the government of Great Britain in recognizing these risks and intervening before a crisis, as well as its persistence in denying the problem, have been emphasized in the academic literature.
Listeriosis (Attaran *et al*, 2008; Collier, 2008; Wilson and Keelan, 2008; Greenberg and Elliott, 2009)	The risks stemming from a change in regulation have not been evaluated and the transfer of responsibility for food safety from public authorities to private companies seems to have engendered a lessening of vigilance and increased the risk level.
Public health SARS (Health Canada, 2003; Buus and Olsson, 2006)	Health Canada Ontario had no risk management system despite repeated calls for one following earlier public health crises in this region (contaminated water, and contaminated blood) so that it was necessary to develop one from scratch in the middle of a crisis.
Natural catastrophes Katrina (White House, 2006; Parker *et al*, 2009)	The dramatic shift in questions of civil security since September 2001 (including the major restructuring leading to the annexation of FEMA by the Department of Homeland Security) was not in place at the time of the events, which weakened the risk management system and led to a slower response from emergency services.
Heat wave (Lagadec, 2004; Thirion *et al*, 2005)	The risks associated with the heat wave were not included in the overall plan, due to a lack of consensus among experts. Analysts also pointed to the slowness of the authorities of institutions and monitoring organizations in reacting, and a trivialization of the phenomenon, the heat being perceived as normal during the summer period.
Tsunami (Oloruntoba, 2005; Schaar, 2005; Kelman, 2006)	Government authorities of the countries affected had no system to detect and warn of tsunamis at the time of the events.

plans, no effective emergency plan, negligence on the part of the staff, a lack of communication with stakeholders, and insufficient training and communication.

In the case of the SARS in Canada (Health Canada, 2003; Buus and Olsson, 2006), the Ontario government had no risk management system in place to fight the pandemic before the first cases appeared in Toronto area hospitals. Yet the need for risk prevention in this area had been known and reported repeatedly since 1997, notably by Judge Krever during the inquiry into the Canadian tainted blood scandal. In his report, Justice Campbell lamented that no action to prevent SARS in Ontario has been undertaken despite all the problems encountered during previous public health crises: 'it is troubling that Ontario ignored so many public health wake-up calls from Mr Justice Krever in the blood inquiry, Mr Justice O'Connor in the Walkerton inquiry, from the Provincial Auditor, from the West Nile experience, from pandemic flu planners and others. Despite many alarm calls about the urgent need to improve public health capacity, despite all the reports emphasizing the problem, the decline of Ontario's public health capacity received little attention until SARS. SARS was the final, tragic wake-up call. To ignore it is to endanger the lives and the health of everyone in Ontario' (Lalonde, 2012, p. 143).

Another interesting example is the case of the 2004 tsunami in the Indian Ocean region, where several experts (Oloruntoba, 2005; Schaar, 2005; Kelman, 2006) have reported serious shortcomings in national planning, basic support infrastructure and risk assessment. Beginning in the 1980s, study after study had highlighted the importance of being better prepared for the probability of a tsunami occurring. Nonetheless, some leaders, including administrators within the Indian government, concluded that this threat was neither the most dangerous nor the most important for the country. *In 1967, the issue of a tsunami warning system for India was raised at the Indian Institute of Science in Bangalore. The idea was supported in principle, but with frequent and severe droughts, river floods, and cyclones causing known levels of destruction, tsunamis were considered to have a lower priority.* (Kelman, 2006, p. 183). Consequently, the Indian government never adopted such a plan.

The examples presented in this section succinctly illustrate the importance that an organization should attach to developing a risk management strategy and integrating this strategy into its mission (Quarantelli, 1988; McEntire and Myers, 2004). The existence of a risk management strategy is instrumental in developing better targeted and pertinent interventions in the face of an organizational crisis. It can also contribute to mitigating any uncoordinated action that could heighten the devastating effects of the crisis that the organization is effectively seeking to eliminate (Roux-Dufort, 2009). At the same time, these examples lead us to question conventional strategic planning models that place the emphasis on planning and technique (the *«what»*) and allow us to focus on the players themselves and their motives and actions; in short, to zero in on the practitioners of the strategy (the *«who»;* see Whittington, 2006;

Jarzabkowski and Spee, 2009). Furthermore, experience feedback derived from crisis situations highlights both the role of plans and the role of the individuals who do or do not implement them.

Organizations that develop inadequate risk management systems or do not use them efficiently or properly

Although the ISO 31000 standard incorporates guiding principles from the literature to promote practices found to be most appropriate for dealing with risk, the effectiveness of the standard in improving risk prevention and management remains uncertain if applied mechanically as an objective tool instead of being seen as a strategic praxis (Whittington, 2006) or a sensitive analysis relying on background knowledge (Aven, 2010) and intuition (Godet, 2000; Boholm, 2010). Crises that have arisen in organizations with relatively structured and detailed risk management systems in place may show the limitations of a technical or measurable approach to the management of risk. For example, the AZF fertilizer factory in Toulouse, France (Dechy *et al*, 2004) – like most European facilities of this type – was subject to the Seveso II Directive, which requires various risk prevention and management measures. These regulatory measures overlap with – and in some cases even exceed – the recommendations of the ISO 31000 standard in terms of analysis and calculation of risk thresholds, implementation of intervention plans, public involvement and consultation, limiting urban development around at-risk sites, systematic examination of hazards by independent experts, systematic analysis of potential impacts on people and the environment, and regular inventory of hazardous substances, among other points. Beyond these regulatory measures, the AZF leadership had implemented various internal risk management measures, and the plant had obtained dual ISO 9001 and ISO 14001 certification. In principle, these certifications require strict and documented measures to manage processes that may have an impact on quality or the environment (Boiral and Roy, 2007). However, all of these measures did not prevent the explosion of an ammonium nitrate warehouse on the site, the deaths of 30 people and the almost total destruction of the AZF plant in Toulouse. Given the well-known hazards of ammonium nitrate and given the various safety standards that the plant was subject to, it is unreasonable to assume that the accidental explosion was related to a lack of planning or ignorance of risks.

Certainly, the case of plant AZF in Toulouse properly illustrates the fact that *having* a risk management strategy is undoubtedly essential, but insufficient to cope with risks (Dynes, 1983, 1994; Quarantelli, 1988). Indeed, a risk management strategy necessitates concrete action at all levels within an organization (Dechy *et al*, 2004). It must include all stakeholders, from the top strategists in the organization and the players in the field, to external practitioners such as security specialists and management consultants (Jarzabkowski and Spee, 2009). In short, the implementation of a strategy is based on the

independent and interconnected action of several players (Weick, 1993) and not only those at the top, which is why it is important to involve all stakeholders.

Organizations that are too small and more generally, companies that lack resources to invest in sophisticated risk management system

Despite its claim for a generic nature and its emphasis on flexibility or the contextualization of practices, the standard may tend to favor the inclusion of known and measurable risks while overlooking less conventional or less measurable risks. In addition, the requirements for conformity with the standard may not be entirely realistic, especially for small and medium-size businesses that usually have fewer resources available to invest in a rigorous and extensive risk management process (Drummond and Chell, 1994; Tierney, 1997; Spillan and Hough, 2003; Smith, 2005; Runyan, 2006; Herbane, 2010). According to Herbane (2010, p. 47), there is a funding paradox in many small and medium-size businesses that 'lead to crisis management being a low priority for leadership and investment'. In reference to an expert from the field of business, Herbane (2010) reports that the financial costs of introducing these techniques for greater business resilience represents a 'grudge purchase'. For their part, Spillan and Hough (2003) show that concern regarding risk management among small business owners appears to be the actual occurrence of a crisis. The tourism industry is, in this regard, a well-documented example by researchers who deplore that the plethora of small businesses that make up this industry have no risk and crisis management (Faulkner, 2001; Ritchie, 2004). The inherent characteristics of this service-based industry, such as the perishability of the product and the interdependence of elements of the product, make the risks potentially very difficult to manage, because supply often cannot quickly be matched to rapid declines in demand (Evans and Elphick, 2005). This sector suffers major disturbances with increasing frequency. In most cases, the direct result is a drop in the number of travelers (Gillet, 2011). The effects are particularly felt in a sector characterized by small firms, operating in regions where employment is scarce. Finally, the tourist sector is very heterogeneous and its contours difficult to define (Glaesser, 2006). As a consequence, this sector faces a challenge in gaining sufficient recognition from political and economic authorities (Blake and Sinclair, 2003; Gillet, 2011). More attention to the contextual situatedness (Boholm *et al*, 2012) may be needed to see how a standard such as ISO 31000 will apply considering the specificities of the tourism sector.

As already outlined in the ISO 31000 standard, the tourism sector highlights the importance of considering the contingencies inherent in each organization through an in-depth analysis of their internal and external strengths. Research in this particular sector (Faulkner, 2001; Ritchie, 2004), as well as most everything related to small- and medium-sized enterprises (Herbane, 2010), show

that the very concept of risk (directed at economic considerations and means to manage growth) and ways of facing risk (product or service diversification, largely tacit and informal risk management through daily activities) differ extensively from what is found in large enterprises. A consensus may be derived from the literature regarding the need to develop management frameworks for risk management adapted to the specific reality of each enterprise.

Organizations that do not manage to integrate risk management into their organizational work/praxis

Hence, economic uncertainty and market fluctuations that affect the company's position within its industry may lead it to reduce its investment in risk management in order to maximize its production capacity in the short term (Perrow, 1999; Ojala and Hallikas, 2006). For instance, according to many authors (Attaran *et al*, 2008; Collier, 2008; Greenberg and Elliott, 2009), the 2008 listeriosis outbreak at Maple Leaf Foods in Canada should be analyzed in the context of change in the Canadian government policy on risk management who seek a new partnership with the private industry. In fact, a few months before the outbreak started, the Canadian government had decided to transfer its inspection duties to the food industry, limiting the government to a supervisory role. In concrete terms, this meant that bacterial screening tests would be conducted by the companies themselves as part of their self-inspection program which was far less extensive than standards usually applied by governmental officers. The crisis caused by the listeriosis outbreak provoked widespread dismay among the public and led independent commissions to recommend that the government keep public health and risk management at a highest priority at the national level. Since the recall of the contaminated products and the public apology from the company president, debate on the best way to prevent such risks has been ongoing.

The case of listeriosis illustrates the importance of true commitment to the effective implementation of an integrated risk management framework (Corvellec, 2010). In fact, the concept of commitment is central to the model of High Reliability Organizations (Rochlin, 1996). Relying on the perspective of practice-based-view, Corvellec (2010) shows that managers will commit to what they value; and what they value emerges from what they practice. In this sense, risk is 'immanent' to managerial practice. Thus, 'risk emerges from the political, strategic, and managerial choices that are made, explicitly or not, about how to run the organization' (Corvellec, 2010, p. 150). Ultimately, managers must learn to walk the talk (Howard, 1996).

Organizations that adopt risk management system as a rational ritual that provides the company with a false feeling of safety and thereby raises their overall risk level

Finally, if not well-intended and ingrained in the strategic practices of the organization (Gherardi and Nicolini, 2000; Whittington, 2006; Boholm, 2010;

Corvellec, 2010), there is a danger that standard's reassuring image may represent a kind of rational myth (Boiral, 2007) or a simulacra (Grandy and Mills, 2004) whose adoption is intended primarily to reassure the internal and external stakeholders (Arvai and Froschauer, 2010). Implementation of the ISO 31000 standard can reinforce the belief in the measurability and controllability of risk. Such overconfidence in risk management (Pauchant, 1990) can lead to neglect of issues that are critical, but not measurable or difficult to plan for. Conversely, the standard can be implemented in a superficial or a symbolic manner, without real commitment, for the purpose of reducing the perception of risk rather than reducing the risks themselves. In such cases, implementation does not actually increase safety, but simply increases confidence by reassuring some stakeholders and soothing their fears of the unknown (Lupton, 1999).

This rather bleak vision of risk management strategy may be sustained insofar as one accepts it as strictly instrumental and symbolic. Samra-Fredericks (2003) believes instead that strategy is a lived experience. To a certain point, its finality eludes those who expound it. Thus, rather than being designed as simple smoke screens, discursive risk management practices may translate concretely into action that will elucidate meaning for all members of an organization (Hendry, 2000). Using Giddens' structuration theory (1991), Hendry (2000) introduced the concept of intentionality to better understand how management decisions are transformed into concrete action. Yet, this intentionality, which involves creating a risk management framework for purely symbolic purposes, may be reinterpreted by different actors within the organization to the point of achieving a different meaning. It may also prompt the development of a risk management framework based on more socially responsible action and behavior. This process of rebuilding meaning is common and highlighted quite distinctly in the work of Weick (1988, 1993) on sensemaking. As a result, Hendry (2000) indicated that strategy is a constructed social practice where discourse plays a mediating role between intention and action. This is in line with the findings of Jarzabkowski and Spee (2009) and Whittington (2006) to the effect that there are many strategic practitioners within an organization, and results achieved are largely the product of their interactions.

Organizations that do not invest in human capital

Organizations that intend to carry on a serious approach to risk management as proposed by ISO 31000 should therefore provide a significant investment in human capital. Risk management is not something which is done once and never re-examined (Quarantelli, 1988; Perry and Lindell, 2003); to keep up to date, the organization must invest in risk management methods on an ongoing basis (McConnell & Drennan, 2006; Boin & McConnell, 2007; Purdy, 2010). Indeed, to be in conformity with the standard, organizations have to invest substantially in the development of risk management skills, even to the extent

of creating a group of experts specifically dedicated to monitoring developments and methodology in this field. Thus, during its evolution, organizations will experience various changes. On the one hand, key personnel may leave the organization and take with them valuable expertise and knowledge. On the other hand, the context can change rapidly, requiring adaptation and continual upgrading of the ISO 31000 system, including changes in the nature of the identified risks, changes in the allocation of resources (financial, material and human) and changes in the emphasis placed on risk management (McConnell and Drennan, 2006). Such adaptation also includes updating plans, staff training and public education through practice exercises and simulations. However, some authors (Hutchins and Wang, 2008; Wooten and James, 2008) lament that human resource management does not receive the attention it deserves in the field of risk management. This lack of attention tends to reinforce the perception commonly held among employees that their organizations do not invest enough in staff training when preparing and planning for risks and crises (Hutchins *et al*, 2008). Yet the merits of programs to train staff to deal with risks and crises have been demonstrated (Denis-Rémis, 2006) as have those of simulation exercises intended to anticipate the reactions of employees, managers and the wider community (Hart, 1997; Crichton *et al*, 2000; Perry, 2004; Pollard and Hotho, 2006). These observations return us to the question of *how* and to what extent organizations are willing to invest in risk management in general and in its human capital in particular.

On the whole, dimensions related to staff training at all levels must be outlined and strengthened during the implementation of the ISO 31000 standard. Hutchins and Wang (2008) invite leaders and managers to reinforce the role of professionals in human resource development (HRD) in the effective implementation of risk and crisis management in five ways: as problem solvers, change agents, organizational designers, organizational empowerers, human capital developers. HRD professionals can help fostering an organizational culture that would enable people to foresee crisis situations. For her part, Lalonde (2011) suggests OD interventions such as coaching, teambuilding, search conference and many others that may contribute to strengthen organizational resilience. These recommendations correspond to what is put forth in the ISO 31000 standard.

Managing Risks as a Situated Practice: General Advices to Managers

Of course, no standard and no risk management system could prevent accidents to happen unfortunately. The analysis of the advantages and limits of the standard ISO 31000 leads to some recommendations for managers who are involved in risk management, recommendations derived from a strategy-as-practice perspective (Schatzki *et al*, 2001; Whittington, 2006; Jarzabkowski and Spee, 2009). Strategic planning has dominated the field of strategy for

many decades but has been highly criticized (Mintzberg 1994a, b) for its rigidity, formalism and as a ritual not really actualized by the organization. The planning view has been highly criticized especially in the field of risk (Boholm, 2010) and crisis management (Dynes, 1994; Quarantelli, 1996). In the planning view, strategy is something organizations *have*. A reflexive application will focus on strategy as something people *do* and introduce practices from the field of organizational development such as future search, teambuilding activities, collaborative structures, laboratory training, and so on (Lalonde, 2011). It will take subjectivity, intuition, past experiences, motivation to use a standard such as ISO 31000 into account (Boholm, 2010; Corvellec, 2010). It will reflect on the realism, pragmatism and integrity of the process followed to assess risk. It will be deeply ingrained in the organizational culture (Deverell and Olsson, 2010) and diffused throughout the organization. It will be highly participative in the way the process is conducted; it will introduce a 'new governance' (Boholm *et al*, 2012) in this strategic endeavor of assessing risks. It will challenge taken-for-granted assumptions and beliefs about risk and risk assessment (Hansson, 2005).

In that perspective, ISO 31000 can be thought of as a first step in risk management, particularly for organizations that do not already have risk management practices in place. It should not become an end in itself, a straitjacket, an iron cage (Di Maggio and Powell, 1983) nor a template to be applied strictly as a tool and without tangible roots in the corporate culture (Corvellec, 2010). Leaders should thus clarify at the outset their main motivations for using ISO 31000 and their perception of it. Is their goal to establish a 'recipe' for risk management? To deal more effectively with previously identified and known risks? To develop a corporate multiple-risk management policy? Such clarification would enable a better evaluation of whether management's expectations are realistic or not, a more precise definition of the goals of implementing a risk management system, and avoidance of using the standard in a too symbolic fashion, as a ritual ceremony (Meyer and Rowan, 1977) or as a simulacra (Grandy and Mills, 2004).

Secondly, as Purdy (2010) rightly points out, leaders should monitor and regularly review the risk management system. Although the ISO 31000 standard itself makes this recommendation, the lack of a certification process could make such follow-up more difficult to conduct. Certification is a process that is marked in time and the organization that wishes to maintain certification must be renewed and be subject to judgments of external auditors. In any event, although ISO 31000 does not explicitly require the use of external or internal audits, nothing prevents organizations from periodically and independently reviewing their risk management systems. Even though they are not required for certification, such audits can encourage monitoring of the system and help maintain active interest in risk management within the organization.

Thirdly, the standard's suggestions should not be used *en bloc*, but rather selectively and with discretion, depending on the specific needs of each organization (Corvellec, 2010) and be seen as a 'situated practice' (Gherardi and Nicolini, 2000). In this perspective, some practical guidance on the implementation of the standard will be required (Purdy, 2010). The suggestions in ISO 31000 are not all necessarily relevant in the same way for all organizations or for all contexts (Leitch, 2010). Risk management issues are too diverse to be encompassed by a single system. For example, some companies could benefit from examining the standard's recommendations in order to facilitate the establishment or improvement of their workplace health and safety management policies. Others may use the standard to implement a new plan for the prevention and management of environmental accidents, or to improve risk prevention measures for transporting and storing hazardous materials. This contingency approach is not necessarily inconsistent with the holistic and multiple-risk perspective proposed by ISO 3100. To the contrary, it allows this holistic view to be adapted to the context and unique characteristics of each organization.

Fourthly, the standard could perhaps be better used to complement, not substitute for, other more conventional risk management systems or those that have already proven useful to the organization, such as questionnaires, scenario analysis, SWOT analysis (strengths, weaknesses, opportunities, threats), HAZOP (Hazard and Operability studies) and others suggested in the ISO guide 73 on risk assessment techniques that accompanies the ISO 31000 standard. For instance, one of the major potential advantages of the standard – compared with most other risk management frameworks – is that it strongly encourages a systematic approach to listening to and dialogue with stakeholders. Risk management is a sensitive subject, particularly with respect to communication with the public and other external stakeholders, which is too often overlooked because of the difficulty of conveying information that could be misinterpreted or potentially compromising (De Lima, 2004). However, it may be essential to include stakeholders in order to understand external pressures better, to improve the organization's image and its practices, and to analyze complex issues from different perspectives (Short, 1984; Renn, 1998; Slovic, 1999; Peretti-Watel, 2001; Marshall and Picou, 2008).

Conclusion

The perspective adopted in this article is based on a critical analysis intended to promote a preventive and informed use of ISO 31000. It aims, indeed, to encourage organizations to exercise vigilance regarding the prevailing beliefs about the possibility of enhancing risk management through implementing an internationally recognized standard with a broad scope. This need for vigilance does not necessarily question the ISO 31000 standard or its main recommendations, but rather *how* it should be interpreted and implemented by organizations. In that

sense, the effectiveness of ISO 31000 is ultimately determined by *how* it is used by organizations, rather than merely whether or not they adopt its management framework. It has been suggested, based on empirical evidence (Boholm, 2010; Corvellec, 2010) and on post-crises analysis that a new turn must be taken in the field of risk management from formal planning approach to reflexive strategy praxis. As pointed out by Ertmer and Newby (1996), 'by employing reflective thinking skills to evaluate the results of one's own learning efforts, awareness of effective learning strategies can be increased and ways to use these strategies in other learning situations can be understood'.

The new ISO 31000 risk management standard makes several important contributions to a field that still has relatively few benchmarks (Smith and Fischbacher, 2009; Leitch, 2010). On the one hand, the generic nature of the standard may help to better identify and manage a variety of risks including threats to the environment, public health and food safety issues, threats to critical infrastructure, hazards presented by certain products, and interruption of the supply chain. This diversity of risks tends to broaden the scope of the standard's applicability to a wide range of situations and organizations. On the other hand, the standard suggests a methodical and structured approach to how to manage risks. As Purdy (2010) points out, while this approach may seem relatively conventional, the standard does succeed in integrating into a single concise and practical model a considerable amount of knowledge accumulated from research on multiple aspects of the field which is widely scattered in the literature and thus difficult to take into account.

However, whatever the proposed recommendations, risk management will always involve a significant amount of unpredictability, uncertainty and the unknown (Lupton, 1999). One of the main pitfalls of risk management is the tendency to minimize – more or less consciously – these intangible and non-rational aspects behind the reassuring image of a formal management system that can seemingly be controlled (Power, 2009). One of the key challenges that modern executives face is certainly that of finding a balance between the need to take risks into account as thoroughly as possible in order to implement appropriate preventive measures and the awareness that risk management cannot be reduced to planned measures and organizational routines. As suggested by many authors (Widalvsky, 1988; Rerup, 2001; Weick and Suncliffe, 2007; Ash and Smallman, 2010; Lalonde, 2010), a blend of anticipation and resilience is required in order for organizations to adapt to the contingencies of each situation and to be ready to imagine innovative and unanticipated/improvised actions (Faraj and Xiao, 2006; Webb and Chevreau, 2006).

Notes

1 According to Peretti-Watel (2001), Ewald (1986) highlighted the importance of insurers in the construction of the concept of risk. They were the first to name the risk and calculate it. They

work both upstream of risk (by compensation) and downstream of risk (by recognizing, or not, fault).

2 This view is also controversial, according to a study by Fischhoff *et al* (1978). When asked whether they knew 'how safe is safe enough?', a group of citizens believed that the amount of residual risk 'foisted' on society is generally too high. The public concern raised by the emergence and proliferation of 'new' risks suggests that the same observation could be made today (see especially Couch *et al*, 2008, concerning post-crisis support groups).

References

Alexander, D. (2005) Towards the development of a standard in emergency planning. *Disaster Prevention and Management* 14(2): 158–175.

Arvai, J.L. and Froschauer, A. (2010) Good decisions, bad decisions: The interaction of process and outcome in evaluations of decision quality. *Journal of Risk Research* 13(7): 845–859.

Ash, J. and Smallman, C. (2010) A case study of decision making in emergencies. *Risk Management* 12(3): 185–207.

Attaran, A. *et al* (2008) Listeriosis is the least of it. *Canadian Medical Association Journal* 179(8): 743–744.

Aven, T. (2010) An integrated framework for decision support on risk and uncertainty. *Risk Management* 12(4): 285–300.

Baird, I.S. and Thomas, H. (1985) Towards a contingency model of strategic risk-taking. *Academy of Management Review* 10(2): 230–243.

Beck, U. (1992) *Risk Society. Towards a New Modernity*. London, UK: Sage Publications.

Bernard, J.G. *et al* (2002) Le risque : un modèle conceptuel d'intégration. [Risk: A Conceptual Model of Integration]. Project report. Centre interuniversitaire de recherche en analyse des organisations (CIRANO), Montréal.

Blake, A. and Sinclair, M.T. (2003) Tourism crisis management. US response to September 11. *Annals of Tourism Research* 30(4): 813–822.

Boholm, A. (2010) On the organizational practice of expert-based risk management: A case of railway planning. *Risk Management* 12(4): 235–255.

Boholm, A., Corvellec, H. and Karlsson, M. (2012) The practice of risk governance: Lessons from the field. *Journal of Risk Research* 15(1): 1–20.

Boin, A. (2009) The new world of crises and crisis management: Implications for policymaking and research. *Review of Policy Research* 26(4): 367–377.

Boin, A. and Lagadec, P. (2000) Preparing for the future: Critical challenges in crisis management. *Journal of Contingencies and Crisis Management* 8(4): 185–191.

Boin, A. and McConnell, A. (2007) Preparing for critical infrastructure breakdowns: The limits of crisis management and the need for resilience. *Journal of Contingencies and Crisis Management* 15(1): 50–59.

Boiral, O. (2003) ISO 9000. Outside the iron cage. *Organization Science* 14(6): 720–737.

Boiral, O. (2007) Corporate greening through ISO 14001: A rational myth? *Organization Science* 18(1): 127–146.

Boiral, O. and Roy, M.J. (2007) ISO 9000: Integration rationales and organizational impacts. *International Journal of Operations and Production Management* 27(2): 226–247.

Buus, S. and Olsson, E.K. (2006) SARS crisis: Was anybody responsible? *Journal of Contingencies and Crisis Management* 14(2): 71–81.

Christmann, P. and Taylor, G. (2006) Firm self-regulation through international certifiable standards: Determinants of symbolic versus substantive implementation. *Journal of International Business Studies* 37(4): 863–878.

Collier, R. (2008) Shifting to food industry self-monitoring may be hazardous. *Canadian Medical Association Journal* 179(8): 755–756.

Corvellec, H. (2009) The practice of risk management: Silence is not absence. *Risk Management* 11(3): 285–304.

Corvellec, H. (2010) Organizational risk as it derives from what managers value: A practice-based approach. *Journal of Contingencies and Crisis Management* 18(3): 145–154.

Couch, S.R., Wade, B. and Kindler, J.D. (2008) Victims' groups following the 9/11 terrorist attacks. *Sociological Inquiry* 78(2): 248–257.

Crichton, M.T., Flin, R. and Rattray, W. (2000) Training decision makers – Tactical decision games. *Journal of Contingencies and Crisis Management* 8(4): 208–217.

Dechy, N., Bourdeaux, T., Ayrault, N., Kodek, M.C. and Le Coze, J.C. (2004) First lessons of the Toulouse ammonium nitrate disaster, September, 21st, AZF plant, France. *Journal of Hazardous Materials* 111(1–3): 131–138.

De Lima, M.L. (2004) Images of the public in the debated about risk. Consequences for participation. *Portuguese Journal of Social Science* 2(3): 149–163.

Denis-Rémis, C. (2006) How can insurance benefit from more effective training programmes: The case of behavioural mitigation. *International Journal of Emergency Management* 3(1): 73–82.

Deverell, E. and Olsson, E.K. (2010) Organizational culture effects on strategy and adaptability in crisis management. *Risk Management* 12(2): 116–134.

Di Maggio, P.J. and Powell, W.W. (1983) The iron cage revisited: Institutional isomorphism and collective rationality in organizational field. *American Sociological Review* 48(2): 147–160.

Douglas, M. and Widalvsky, A. (1982) *Risk and Culture: An Essay on the Selection of Technical and Environmental Dangers*. Berkeley, CA: University of California Press.

Drummond, H. and Chell, E. (1994) Crisis management in a small business: A tale of two solicitor's firms. *Management Decision* 32(1): 37–40.

Duclos, D. (1987) La construction sociale du risque : le cas des ouvriers de la chimie face aux dangers industriels [The social construction of risk: The case of chemical workers facing industrial hazards]. *Revue française de sociologie* 28(1): 17–42.

Dynes, R.R. (1983) Problems in emergency planning. *Energy* 8(8–9): 653–660.

Dynes, R.R. (1994) Community emergency planning: False assumptions and inappropriate analogies. *International Journal of Mass Emergencies and Disasters* 12(2): 141–158.

Ertmer, P.A. and Newby, T.J. (1996) The expert learner: Strategic, self-regulated, and reflective. *Instructional Science* 24(1): 1–24.

Evans, N. and Elphick, S. (2005) Models of crisis management: An evaluation of their value for strategic planning in the international travel industry. *The International Journal of Tourism Research* 7: 135–150.

Ewald, F. (1986) *L'Etat providence* (The Welfare State). Editions Grasset et Fasquelle, Paris.

Faraj, S. and Xiao, Y. (2006) Coordination in fast-response organisations. *Management Science* 52(8): 1155–1169.

Faulkner, B. (2001) Towards a framework for tourism disaster management. *Tourism Management* 22(2): 135–147.

Fischhoff, B., Slovic, P., Lichtenstein, S., Read, S. and Combs, B. (1978) How safe is safe enough? A psychometric study of attitudes towards technological risks and benefits. *Policy Sciences* 9(2): 127–152.

Galland, J.P. (2003) Calculer, gérer, réduire les risques: des actions disjointes? [Calculating, managing and reducing risks: Unconnected actions?] *Annales des ponts et chaussées* 105: 37–45.

Gephart, R.P., Van Maanen, J. and Oberlechner, T. (2009) Organizations and risk in late modernity. *Organization Studies* 30(2–3): 141–155.

Gherardi, S. and Nicolini, D. (2000) To transfer is to transform: The circulation of safety knowledge. *Organization* 7(2): 329–348.

Giddens, A. (1991) *Modernity and Self-Identity*. Stanford, CA: Stanford University Press.

Gilbert, C. (2007) Crisis analysis: Between normalization and avoidance. *Journal of Risk Research* 10(7): 925–940.

Gillet, C. (2011) Risque et excellence d'une destination touristique : l'exploration de la relation entre deux concepts antinomiques [Risk and excellence of tourist destination: The exploration of the relationship between two contradictory concepts]. *Téoros* [Online], 30(1): http://teoros.revues.org/1258.

Glaesser, D. (ed.) (2006) *Crisis Management in the Tourism Industry*. Oxford, UK: Butterworth-Heimann.

Gralepois, M. (2008) Les risques collectifs dans les agglomérations françaises. Contours et limites d'une approche territoriale de prévention et de gestion des risques à travers le parcours des agents administratifs locaux [Collective risk in French cities. Contours and limitations of a territorial approach to risk prevention and management through the experience of local administrators]. PhD thesis. Université Paris-Est, Laboratoire Territoires, Techniques et Sociétés, CNRS.

Godet, M. (2000) The art of scenarios and strategic planning: Tools and pitfalls. *Technological Forecasting and Social Change* 65: 3–22.

Grandy, G. and Mills, A.J. (2004) Strategy as simulacra? A radical reflexive look at the discipline and practice of strategy. *Journal of Management Studies* 41(7): 1153–1170.

Greenberg, J. and Elliott, C. (2009) A cold cut crisis: Listeriosis, Maple Leaf Foods, and the politics of apology. *Canadian Journal of Communication* 34(2): 189–204.

Hansson, S.O. (2005) Seven myths of risk. *Risk Management* 7(2): 7–17.

Harrald, J.R., Marcus, H. and Wallace, W.A. (1990) The Exxon Valdez: An assessment of crisis prevention and management systems. *Interfaces* 20(5): 14–30.

Hart, P. (1997) Preparing policy makers for crisis management: The role of simulations. *Journal of Contingencies and Crisis Management* 5(4): 207–215.

Hart, P., Heyse, L. and Boin, A. (2001) Guest editorial introduction. New trends in crisis management practice and crisis management research: Setting the agenda. *Journal of Contingencies and Crisis Management* 9(4): 181–188.

Health Canada (2003) *Learning from SARS. Renewal of Public Health in Canada*. National Advisory Committee on SARS and Public Health, Canada, http://www.hc-sc.gc.ca/english/protection/warnings/sars/learning.html, accessed March 2011.

Hendry, J. (2000) Strategic decision making, discourse, and strategy as social practice. *Journal of Management Studies* 37(7): 955–957.

Herbane, B. (2010) Small business research: Time for a crisis-based view. *International Small Business Journal* 28(1): 43–64.

Howard, A. (1996) High-involvement leadership: Moving from talk to action. *Career Development International* 1(1): 6–10.

Hutchins, H.M., Annulis, H. and Gaudet, C. (2008) Crisis planning. Survey results from Hurricane Katrina and implications for performance improvement professionals. *Performance Improvement Quarterly* 20(3/4): 27–51.

Hutchins, H.M. and Wang, J. (2008) Organizational crisis management and human resource development: A review of the literature and implications to HRD research and practice. *Advances in Developing Human Resources* 10(3): 310–330.

Jarzabkowski, P. and Spee, A.P. (2009) Strategy-as-practice: A review and future directions for the field. *International Journal of Management Reviews* 11(1): 69–95.

Kelman, I. (2006) Warning for the 26 December 2004 tsunamis. *Disaster Prevention and Management* 15(1): 178–189.

Krimsky, S. and Golding, D. (1992) *Social Theories of Risk*. Westport, CT: Praeger.

Lagadec, P. (2004) Understanding the French 2003 heat wave experience: Beyond the heat, a multi-layered challenge. *Journal of Contingencies and Crisis Management* 12(4): 160–169.

Lalonde, C. (2007) Primary healthcare organizations facing a disaster: The Quebec experience. *Disaster Prevention and Management. An International Journal* 16(1): 42–55.

Lalonde, C. (2010) Organisational socialisation in a crisis context. *Disasters* 34(2): 360–379.

Lalonde, C. (2011) Managing crises through organisational development. A conceptual framework. *Disasters* 35(2): 443–464.

Lalonde, C. (2012) A diagnostic method in the study of management disaster: A review of fundamentals and practices. In: J.P. Tiefenbacher (ed.) *Approaches to Managing Disaster Assessing Hazards, Emergencies and Disaster Impacts*. Texas, USA: InTech Publisher.

Lanska, D.J. (1998) The mad cow problem in the UK. Risk perceptions, risk management, and health policy development. *Journal of Public Health Policy* 19(2): 160–183.

Laporte, T. (1994) A Strawman speaks up: Comments on *The Limits of Safety*. *Journal of Contingencies and Crisis Management* 2(4): 207–211.

Leitch, M. (2010) ISO 31000: 2009 – The new international standard on risk management. *Risk Analysis* 30(6): 887–892.

Lerbinger, O. (1997) *The Crisis Manager. Facing Risk and Responsibility*. Mahwah, NJ: Lawrence Erlbaum Associates.

Leveson, N., Dulac, N., Marais, K. and Carroll, J. (2009) Moving beyond normal accidents and high reliability organizations: A systems approach to safety in complex systems. *Organization Studies* 30(2–3): 227–249.

Linnerooth-Bayer, J., Löfstedt, R. and Sjötedt, G. (2001) *Transboundary Risk Management*. London, UK: Earthscan Publications.

Lupton, D. (1999) *Risk*. London: Routledge.

Malenfant, R. (2009) Risk, control and gender: Reconciling production and reproduction in the risk society. *Organization Studies* 30(2–3): 205–227.

Marshall, B.K. and Picou, J.S. (2008) Postnormal science, precautionary principle, and worst cases: The challenge of twenty-first century. *Sociological Inquiry* 78(2): 230–247.

McConnell, A. and Drennan, L. (2006) Mission impossible? Planning and preparing for crisis. *Journal of Contingencies and Crisis Management* 14(2): 59–70.

McEntire, D. and Myers, A. (2004) Preparing communities for disasters: Issues and processes for government readiness. *Disaster Prevention and Management* 13(2): 140–152.

Meyer, J.W. and Rowan, B. (1977) Institutionalized organizations: Formal structure as myth and ceremony. *American Journal of Sociology* 83(2): 340–363.

Mintzberg, H. (1994a) Rethinking strategic planning. Part I: Pitfalls and fallacies. *Long Range Planning* 27(3): 12–21.

Mintzberg, H. (1994b) Rethinking strategic planning. Part II: New roles for planners. *Long Range Planning* 27(3): 22–23.

Mitroff, I.I. and Alpasian, M.C. (2003) Preparing for evil. *Harvard Business Review* 81(4): 109–115.

Monterrubio, J.C. (2010) Short-term economic impacts of influenza A (H1N1) and government reaction on the Mexican tourism industry: An analysis of the media. *International Journal of Tourism Policy* 3(1): 1–15.

Noji, E.K. (2001) The global resurgence of infectious diseases. *Journal of Contingencies and Crisis Management* 9(4): 223–232.

Ojala, M. and Hallikas, J. (2006) Investment decision-making in supplier networks: Management of risk. *International Journal of Production Economics* 104(1): 201–213.

Oloruntoba, R. (2005) A wave of destruction and the waves of relief: Issues, challenges and strategies. *Disaster Prevention and Management* 14(4): 506–521.

Parker, C.F., Stern, E., Paglia, E. and Brown, C. (2009) Preventable catastrophe? The Hurricane Katrina disaster revisited. *Journal of Contingencies and Crisis Management* 17(4): 206–220.

Pauchant, T.C. (1990) *We're So Big and Powerful Nothing Bad Can Happen to Us*. New York: Carol Publishing Group.

Pearson, C.M. and Clair, J.A. (1998) Reframing crisis management. *Academy of Management Review* 23(1): 59–76.

Pearson, C.M. and Mitroff, I.I. (1993) From crisis prone to crisis prepared: A framework for crisis management. *Academy of Management Executive* 7(1): 48–59.

Peretti-Watel, P. (2001) *La société du risque* [*The Risk Society*]. Paris, France: Éditions La Découverte.

Perret, H., Audétat, M., Bordogna-Petriccione, B., Joseph, C. and Kaufmann, A. (2005) *Approches du risque : une introduction* [*Addressing Risk: An Introduction*]. Geneva, Switzerland: Les Cahiers du RIBios, Institut Universitaire d'Études du Développement (IUED).

Perrow, C. (1999) *Normal Accidents: Living with High-Risk Technologies*. New York, USA: Basic Books.

Perry, R. (2004) Disaster exercise outcomes for professional emergency personnel and citizen volunteers. *Journal of Contingencies and Crisis Management* 12(2): 64–75.

Perry, R. and Lindell, M.K. (2003) Preparedness for emergency response: Guidelines for the emergency planning process. *Disasters* 27(4): 336–350.

Pollard, D. and Hotho, S. (2006) Crises, scenarios and the strategic management process. *Management Decision* 44(6): 721–736.

Poumadère, M., Mays, C., Le Mer, S. and Blong, R. (2005) The 2003 heat wave in France: Dangerous climate change here and now. *Risk Analysis* 25(6): 1483–1494.

Power, M. (2004) The risk management of everything. *The Journal of Risk Finance* 5(3): 58–65.

Power, M. (2009) The risk management of nothing. *Accounting, Organizations and Society* 34(6/7): 849–855.

Purdy, G. (2010) SO 31000: 2009 – Setting a new standard for risk management. *Risk Analysis* 30(6): 881–886.

Quarantelli, E.L. (1988) Disaster crisis management: A summary of research findings. *Journal of Management Studies* 25(4): 373–385.

Quarantelli, E.L. (1996) The future is not the past repeated: Projecting disasters in the 21st century from current trends. *Journal of Contingencies and Crisis Management* 4(4): 228–240.

Quarantelli, E. (2001) Another selective look at future social crises: Some aspects of which we can already see in the present. *Journal of Contingencies and Crisis Management* 9(4): 233–237.

Quarantelli, E.L., Lagadec, P. and Boin, A. (2007) A heuristic approach to the future disasters and crises. In: H. Rodriguez, E. Quarantelli and R.R. Dynes (eds.) *Handbook of Disaster Research*. New York, USA: Springer, pp. 16–41.

Raz, T. and Hillson, D. (2005) A comparative review of risk management standards. *Risk Management* 7(4): 53–66.

Renn, O. (1998) The role of risk perception for risk management. *Reliability, Engineering and System Safety* 59(1): 49–62.

Rerup, C. (2001) Houston, we have a problem: Anticipation and improvisation as sources of organizational resilience. *Comportamento Organizacional E Gestào* 7(1): 27–44.

Ritchie, B.W. (2004) Chaos, crises and disasters: A strategic approach to crisis management in the tourism industry. *Tourism Management* 25(6): 669–683.

Robert, B. and Lajtha, C. (2002) A new approach to crisis management. *Journal of Contingencies and Crisis Management* 10(4): 181–191.

Rochlin, G. (1996) Reliable organizations: Present research and future directions. *Journal of Contingencies and Crisis Management* 4(2): 55–59.

Rochlin, G. (1999) Safe operation as a social construct. *Ergonomics* 42(11): 1549–1560.

Rochlin, G., La Porte, T.R. and Roberts, K.H. (1987) The self-designing high-reliability organization: Aircraft carrier flight operations at sea. *Naval War College Review* 40(4): 76–90.

Roux-Dufort, C. (2009) The devil lies in details! How crises build up within organizations. *Journal of Contingencies and Crisis Management* 17(1): 4–11.

Ruefli, T.W., Collins, J.M. and Lacugna, J.R. (1999) Risk measures in strategic management research: Auld lang syne? *Strategic Management Journal* 20(2): 167–194.

Runyan, R.C. (2006) Small business in the face of crisis: Identifying barriers to recovery from a natural disaster. *Journal of Contingencies and Crisis Management* 14(1): 12–26.

Salehi, R. and Ali, S.H. (2006) The social and political context of disease outbreaks: The case of SARS in Toronto. *Canadian Public Policy* 32(4): 373–385.

Samra-Fredericks, D. (2003) Strategizing as lived experience and strategists' everyday efforts to shape strategic direction. *Journal of Management Studies* 40(1): 141–174.

Schaar, J. (2005) Learning lessons from the tsunami. International Federation of Red Cross and Red Crescent Societies, http://www.ifrc.org/docs/news/opinion05/05121402/index.asp, accessed 18 August 2011.

Schatzki, T.R., Knorr-Celina, K. and Savigny, E.V. (2001) *The Practice Turn in Contemporary Theory*. London: Routledge.

Scheytt, T., Soin, K., Sahlin-Andersson, K. and Power, M. (2006) Special research symposium: Organizations and the management of risk. *Journal of Management Studies* 43(6): 1331–1337.

Secretariat of the ISO. (2009a) *ISO 31000: Risk Management – Principles and Guidelines*. Geneva, Switzerland: International Organization for Standardization.

Secretariat of the ISO. (2009b) *ISO 73: Risk Management – Vocabulary*. Geneva, Switzerland: International Organization for Standardization.

Secretariat of the ISO. (2009c) *IEC/ISO 31010 – Risk Management – Risk Assessment Techniques*. Geneva, Switzerland: International Organization for Standardization.

Sen, F. and Egelhoff, W.G. (1991) Six years and counting: Learning from crisis management at Bhopal. *Public Relations Review* 17(1): 69–83.

Séguin, E. (2005) The UK BSE crisis: Strengths and weaknesses of existing conceptual approaches. *Science and Public Policy* 27(4): 293–301.

Short, J.F. (1984) The social fabric at risk: Toward the social transformation of risk analysis. *American Sociological Review* 49(6): 711–725.

Shrivastava, P. (1987) *Bhopal: Anatomy of a Crisis*. Cambridge, MA: Ballinger.
Shrivastava, P. (1994) Long term recovery from the Bhopal crisis. In: J.K. Mitchel (ed.) *Long Term Recovery from Disasters*. Tokyo, Japan: UN University Press.
Slovic, P. (1999) Emotion, sex, politics, and science: Surveying the risk-assessment battlefield. *Risk Analysis* 19(4): 689–701.
Smith, D. (2005) Business (not) as usual: Crisis management, service recovery and the vulnerability of organisations. *Journal of Services Marketing*. 19(5): 309–320.
Smith, D. and Fischbacher, M. (2009) The changing nature of risk and risk management: The challenge of borders, uncertainty and resilience. *Risk Management* 11(1): 1–12.
Spillan, J. and Hough, M. (2003) Crisis planning in small businesses: Importance, impetus and indifference. *European Management Journal* 21(3): 398–407.
Thirion, X., Debensason, D., Delarozière, J.C. and San Marco, J.L. (2005) August 2003: Reflections on a French summer disaster. *Journal of Contingencies and Crisis Management* 13(4): 153–158.
Thompson, P.B. and Dean, W. (1996) Competing conceptions of risk. *Risk: Health, Safety and Environment* 7(4): 361–384.
Tierney, K. (1997) Business impacts of the Northridge earthquake. *Journal of Contingencies and Crisis Management*. 5(2): 87–97.
Webb, G.R. and Chevreau, F.R. (2006) Planning to improvise: The importance of creativity and flexibility in crisis responses. *International Journal Emergency Management* 3(1): 66–72.
Weick, K. (1988) Enacted sensemaking in crisis situations. *Journal of Management Studies* 25(4): 305–317.
Weick, K. (1993) The collapse of sensemaking in organizations: The Mann Gulch disaster. *Administrative Science Quarterly* 38(4): 628–652.
Weick, K. (2010) Reflections on enacted sensemaking in the Bhopal disaster. *Journal of Management Studies* 47(3): 537–550.
Weick, K. and Suncliffe, K. (2007) *Managing the Unexpected. Resilient Performance in an Age of Uncertainty*. San Francisco, CA: Jossey-Bass Publishers.
White House (2006) *The Federal Response to Hurricane Katrina: Lessons Learned*, Office of the Assistant to the President for Homeland Security and Counterterrorism. Washington, DC, USA, http://www.whitehouse.gov/reports/.
Whittington, R. (2006) Completing the turn in strategy research. *Organization Studies* 27(5): 613–634.
Widalvsky, A. (1988) *Searching for Safety*. Berkeley, CA: University of California Press.
Wilson, K. and Keelan, J. (2008) Learning from *Listeria*: The autonomy of the public health agency of Canada. *Canadian Medical Association Journal* 179(9): 877–879.
Wooten, L.P. and James, E.H. (2008) Linking crisis management and leadership competencies: The role of human resource development. *Advances in Developing Human Resources* 10(3): 352–379.

