IS THE EMERGENCE OF ORGANIZATIONAL PATTERNS A SUCCESS FACTOR OF CRISIS MANAGEMENT?

**Cédric DENIS-REMIS, Cheila COLARDELLE,
Valérie GUINET and Jean-Luc WYBO**

Ecole des Mines de Paris[1]

Abstract:

On December 12, 1999 the tanker "Erika" sunk off the Brittany coast of France, pouring more than 12 000 tons of heavy fuel into Atlantic waters. A few days later, pollution reached the shore and many municipalities were confronted with a crisis that they had never experienced before. In the four municipalities that we have studied, the management of the pollution is characterized by the spontaneous emergence of efficient organizational patterns.

This paper presents an analysis of the management of this crisis, at the municipality level, based on the perceptions and actions of the many stakeholders who contributed to the resilience of organizations.

1. Introduction

In 2001, the Cindynics centre of the Ecole des Mines de Paris conducted for the French Ministry of Territorial Planning and the Environment (Ministère de l'Aménagement du Territoire et de l'Environnement) a mission concerning the analysis of the management of the Erika oil spill at the municipality level.

This mission aimed at reconstructing the history of this catastrophe for 4 coastal municipalities (Loire-Atlantique: Pornic and la Turballe; Morbihan: Belle-île en mer and Ploemeur) greatly affected by this catastrophe.

The methodology used [Wybo 2001[a]] is two fold. The first part represents the collecting of individual experiences, which aims at conserving memories of the catastrophe. The second part is represented by the sharing of experiences aimed at enabling the actors to obtain a global and detailed picture of the management of this crisis. This sharing phase is made possible by a meeting in which all the actors that participated in this management get together in order to approve the information and knowledge collected and to highlight the positive ideas in line with the will to promote a positive return on experience.

The management of this accident cannot be represented in a snapshot form, as it comprises a succession of events and decisions, the consequences of which drive the evolution of the situation. Consequently, the formalism that is used in this methodology is represented by a "string of key events" [Colardelle 2001] consisting of a group of decision cycles end events that are at the basis of

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[1] Ecole des Mines de Paris – Pôle Cindyniques, BP 207, F-06904 Sophia-Antipolis (France) – http://www.cindy.ensmp.fr

the evolution of the situation. This formalism allows the representation of knowledge, in a way that each actor can identify his/her contribution by retrieving a reflection of his/her own experience as well as that of the totality of the actors that have participated in the management of the catastrophe.

This methodology aims at taking into account human and organizational factors and at identifying and meeting the actors who participated in the management of the crisis. In this way, in the quest for "objective truth," almost 30 people were involved in the case study of Belle-île en mer. The formalization of their experiences represents the memory of the management of this catastrophe as each actor lived or experienced it first hand.

This paper will present the elements that took part in the emergence of organizational patterns and that were identified by the analysis of the actions and the perceptions of the many stakeholders who acted in the management of this catastrophe.

2.   The reasons for the emergence of organizational models?

In the Erika oil spill many factors contributed to intensifying the crisis. The Erika catastrophe may only have been an incident if it had not happened in deteriorated conditions, a phenomenon that is frequently observed for major accidents.

> *Imperceptibly or suddenly the system will pass from a normal functioning mode to a deteriorate functioning mode that could give birth to an incidental or an accidental sequence. Clearly, the system will become fragile and very sensitive from new damages and from unsuitable human behavior. The more the functioning mode becomes deteriorated, the higher the potential risk is.* [Translated from Nicolet 1998]

During the first few days of the catastrophe, people engaged in cleaning up had to deal with a violent storm that affected the whole of France. Furthermore, the French meteorology centre predicted a drift of the oil slick towards southern areas of the French Atlantic coast. Consequently, many of the resources, sent to the South, where not available, and the clean-up phase initially had to deal with the pragmatic management of all available resources.

Two elements are the principal factors of the existence of a crisis situation on-land, those being the organization, particularly the entities involved in the cleaning up of the pollutant, and the quantity of pollutant. The second is directly linked to the first. If the pollutant can be gathered, stored and recycled without problem, the oil spill accident would not have evolved into a crisis situation (figure 1).

For treating marine pollution there exists in France a written emergency plan call PolMar (Marine Pollution). This emergency plan is the framework for creating an efficient organization, but this kind of organization is underestimated because few people are aware of it and these type of accidents are not frequent.

Furthermore, this emergency plan (which is specific for each administrative region) was very old and had not been updated for some regions. For example, in Loire Altlantique the last update was done in 1984. As such, many of the services of the Ministry were not aware of this plan.

The Erika pollution management situation is particularly deteriorated. This situation presents an organizational model (PolMar) which is partly unknown or unsuitable to the management of this crisis. Therefore, the majority of stakeholders, who are committed by their duties or by their convictions to overcome this catastrophe, gather their actions around a same objective: doing something efficient against the oil spill.

Figure 1: Importance of the evacuation of the pollutant in crisis management
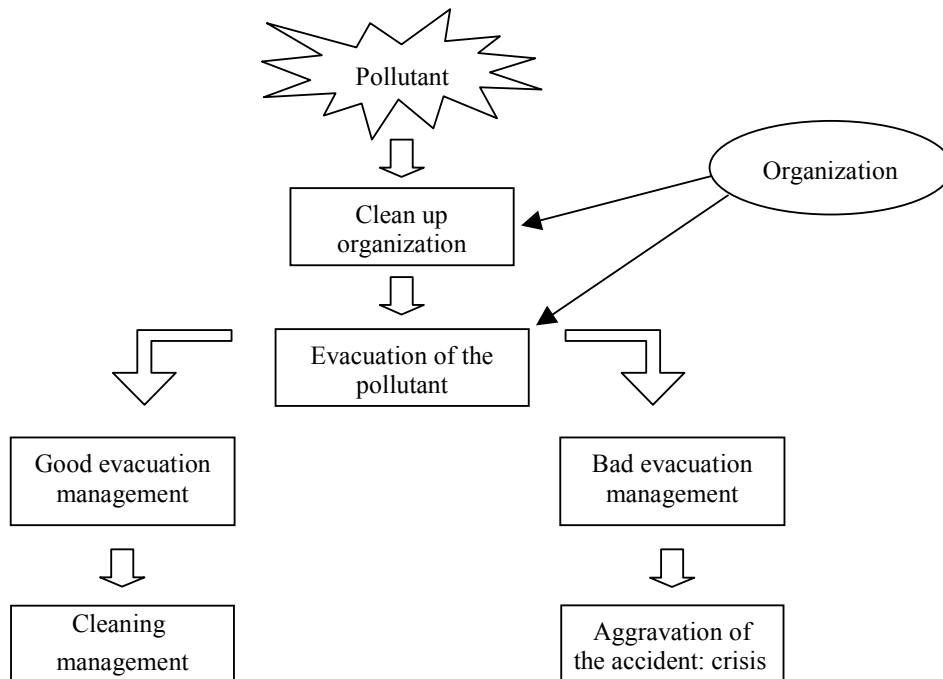
3. The manner in which organizational patterns emerge?

The management of the crisis allowed for the implementation of immediate action on land through a process of initial improvisation. However, the allocation of roles in a participative manner rapidly took place and, over time, there was a gradual evolution of these roles and of the tasks to be accomplished. The network of actors in the municipalities that we have studied was made up of people who, for the most part, had already worked together and were already familiar with their environment.

The four municipalities are characterized by the spontaneous emergence of quite specific organizational patterns, which demonstrated a low degree of planning. But in all of these organizations, some stakeholders are or become leaders and agglomerate actors around them. Topper and Carley (1999) have studied emergence of organizations in the Exxon Valdez crisis:

> *If the Integrate crisis management units (ICMU) evolve as an emergent coordinating group, then early in the crisis response, individual organizations are disconnected. But as time progresses, organizations begin to establish relationships with their neighbors until finally, a coordinating group emerges from among participating organizations to more effectively manage their interdependencies; the ICMU network becomes connected.* [Topper 1999]

So, this emergence of organizational patterns is spontaneous but requires a kernel of actors integrated in a network of actors. Those authors represent a centralized system with a diagram organized by a pre-existing centralized group, and the structure advance by increasing centralization.

> *The large central node in the diagram represents a pre-determined coordinating organization or small group of organizations that directs the activities of other*

organizations. Over time, the network grows in complexity but remains highly centralized. [Topper 1999]

In this network, the capacity domain of each stakeholder must be identified. Thus, communication around "who does what" in the first few days of the catastrophe may have limited damage to the environment.

4. Degree of complexity.

The crisis introduced a notion of uncertainty about the evolution of events and consequences. The crisis also introduced a notion of complexity:

> *The complexity (aspects linked to prevention, to aid services, legal and financial factors, to the return to a normal status) has an impact on the number and types of actors.* [Translated from Condemine 2000]

The first problem we met with when we studied the Erika oil spill is the diversity and the number of different stakeholders. The large number of parties increased the complexity of the organizations.

As we have seen, those organizations are not fixed in time; they advance in function of the behavior and the actions of the different stakeholders.

It is possible to distinguish different phases in this management situation, all characterized by ruptures with varying degrees of visibility, such as the departure of volunteers following the announcement of the toxicity of the pollutant or the transition to professional status.

> *Each crisis management has a natural dynamic, with peaceful periods and some more chaotic periods. Often the peaceful moments are favorable to re-structuring and learning from past actions whilst chaotic moments are reserved for action only.* [Translated from Colardelle 2001]

The organizations that have emerged are complex systems, and for each municipality present specific characteristics.

5. Is the emergence of organizational patterns a factor of success in crisis management ?

The complexity of these organizational patterns is one "key" to the management success. This success is imputed to a certain number of factors such as the implication of local political systems, the desire of the crisis unit to communicate with the inhabitants of the municipalities, the actions of local associations in their transmission of information, the quality and technical assistance given by the Centre of Documentation and Research and Experimentation on accidental water pollution (*Cedre*), or the roles of individuals that emerged during the catastrophe. These examples are integrated in the complexity and in the reflection of the image of the ecosystem and thus make it difficult to determine the degree of implication of each individual actor because of the diversity and sometimes non-visibility of the interrelations.

In all the organizational models we have studied, there is more communication between the different hierarchical levels than in a normal situation.

> *Unfortunately, communication difficulties arise when organizations deal with industrial incidents and accidents. Most of these result from the fact that management doesn't communicate enough on the "why" (why procedures are established as they are, why action is dangerous) while staff does not communicate enough on the "how" (how they manage the process, how they undertake an activity)* [Wybo 2001[b]].

In deteriorated situations, the communication is also deteriorated. But, emergence of organizational models allow emergence of new forms of communication.

Organizations that emerged show the importance of communication during an emergency, but also in normal situations because communication deteriorates during the development of an accident. These organizational models constitute frameworks that support crisis management in becoming more resilient to new perturbations.

6. Conclusion

The return on experience has allowed for the conservation of a memory of this accident before it is erased from all minds. The return on experience method also permitted an analysis of the management of the Erika catastrophe as well as an individual and collective learning experience of the stakeholders that struggled against this pollution.

The analysis of this complexity has revealed the factors that contributed to the resilience of organizations in dealing with this catastrophe. For the municipalities that we have studied, the emergence of organizations took an important part in the success of crisis management.

Sharing experiences also participates in learning lessons from crisis management in order to improve prevention and protection against these type of catastrophes, and reduce coastal pollution and damage.

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Authors biographies

Mr. Cédric Denis-Rémis is research engineer in risk management at Ecole des Mines de Paris (Pôle Cindyniques).

Ms. Cheila Colardelle is research engineer at Pôle Cindyniques. Currently enrolled in a PhD on organizational management.

Mrs. Valérie Guinet is research engineer at Pôle Cindyniques.

Dr. Jean-Luc Wybo is the Director of the Pôle Cindyniques.