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## **RISK COMMUNICATION IMPORTANCE**

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### **ABSTRACT**

Risk Communication has shown its importance in the elaboration of emergency plans in the Chemical industry. In the 90's, the UNEP developed the APELL (Awareness and Preparedness for Emergency at Local Level) plan, a risk management methodology used by dangerous chemical facilities. The methodology comprises the commitment of both Government and the community located in the risk area in the development of the emergency plan. In the nuclear sector, there is no similar methodology developed so far. However, establishing a communication channel between the nuclear segment and the community is essential. In Brazil, the construction of Angra 3 and the RMB (Multi Purpose Reactor) project stand as nuclear initiatives that improve the importance of a good communication to the public. Security issues of these projects are natural sources of concernment to the public, which is aggravated by events such as the Fukushima disaster. Without an effective communication about what means the presence of nuclear plants and reactors in a specific area, the interested public will only have an alarmist vision of the subject, given by those against these facilities.

### **1. INTRODUCTION**

In the 1970-80s, due to the increase of major industrial accidents in the developed and developing countries, causing many fatalities and injuries, we observe the creation of international programs aiming to reduce the number of technological environmental accidents and their consequences for human health and the environment [1].

One common feature of these various accidents was the lack of information among the public about what was happening and how to proceed in these situations. Besides, local populations were misinformed about the risks they faced by living nearby those hazardous industrial facilities [2].

It was observed that contingency plans in which only the institutions (industry and government bodies) were previously prepared for emergencies had limited effectiveness. Uninformed affected populations panicked and had chaotic behaviors when faced with unexpected events, hampering the very action of the emergency services [2].

Several international initiatives were created aiming to increase the prevention of accidents and the effectiveness of its emergency plans in case of their occurrence. These programs created a series of shared information such as lists of accidents occurred in different countries, hazardous chemicals and procedures to minimize their harmful effects, guide manuals for the preparation of emergency plans, among others

One of these programs was APELL (Awareness and Preparedness for Emergency at Local Level), which was elaborated by the United Nations Environmental Program (UNEP) in 1986. This program was based on two principles: increasing the public awareness about risks and include their participation in the elaboration of emergency plans. Only a collaborative plan, that integrates interests and information of all involved, i.e., general public, local communities, government (all levels, particularly local), and industry can lead to efficient and successful implementation of emergency plans [3].

## **2. RISK COMMUNICATION**

Risk communication is the process of communicating to the general public about the risks involved in certain industrial activities regarding human health, natural and urban environments, and the population itself. In a dangerous facility, various security procedures are required for its operation. However, in case of accidents, which experts tend to minimize but admit that can happen, the workers and the population living in the vicinity of the facility may be exposed to products that cause serious damage to their health. The more information and knowledge these people have, the more likely they will know how to protect themselves [4].

According to the National Research Council (National Research Council - NRC) of the USA, “risk communication can be defined as an interactive process of exchange of information and opinions among individuals, groups and institutions concerning a risk or potential risk to human health or the environment “[5, p.15].

Risk communication involves transmitting clearly encrypted information and technical data, such as tables, graphs and statistics, facilitating the understanding of the information by the public. In order to carry it out, one must know the audience to whom such communication is directed - who they are and what their fears are - and which information they demand [6].

Communicating risks is a two-way process, involving active listening, not just speech. In order to exist and be effective, it involves cooperation and joint actions. If the communicator sees him/herself as the subject of the actions and faces the audience as the object of that

action, determining what the public should know and how to proceed, risk communication does not happen [5].

Risk communication is a resource to disseminate risk information to the general public, but its purpose is not to explain the facts using simple and not alarming language. It is intended to provide enough information for people to understand the technicalities of the risks they are exposed to, so they can decide/make decisions for themselves in order to avoid, mitigate or face them [5].

Risk communication is not only focused on the message, it involves being aware of the values, attitudes, opinions and fears of the target public. Being active and having commitment to dialogue are important features for those who intend to accomplish this task [6]. As expressed by Sandman (1997: p. iii): "Learning to listen better is much more central to risk communication than learning to explain better."

The audience addressed by risk communications is seldom homogeneous. Usually the audience is very heterogeneous, composed by a variety of groups of people with different concerns and demands [7].

Like its audience, the purpose of risk communication can also be varied. In certain situations it is necessary to alert an apathetic public to motivate them to act. In others, it may be necessary to calm an uneasy public, informing and seeking to build a consensus, showing that there is no reason for concern [7, 4].

The strategy for reaching each of these goals should also be varied. However, the ideal is one in which the public understands the technical issues and risk information, and the industry understands that it is necessary to consider the concerns, fears and values of the public [4, 5].

Sometimes, because of a difference of perception, the population may become alarmed by an event that was not considered an emergency by experts or responders. Related to radiation emergencies, the key point for a successful emergency management is to have an effective communication with the public, which will facilitate the implementation of protective actions and reduce negative psychological impacts [8].

### **3. DIFFERENT PERCEPTION OF RISK**

The perception of risk is not always shared by experts and the public, and attempts to change the public perception without trying to understand what it considers important cancels out the risk communication efforts [6, 7, 9].

Paul Slovic argues that unlike experts who are technologically sophisticated and employ risk assessment to determine the risk, the majority of the population uses only its intuitions, which are usually inaccurate. Judgments are made with what they know or have heard about risks, influenced by the memory of past events and imagination of future events. Often, experiences are received through the media, which advertise all sorts of mishaps and threats occurring on the planet [9].

To understand which factors determine risk perceptions it is necessary to understand how people think and respond to risk. Risks that cause large numbers of victims tend to be overestimated while, on the other hand, risks that take few lives or involve nonfatal forms tend to be underestimated [9].

To better explain why the risk that scares the public is considered negligible by experts, Peter Sandman created the equation (1) where risk is the sum of danger, in a very particular conception, and outrage.

$$\textit{Risk} = \textit{Hazard} + \textit{Outrage} \quad (1)$$

The correct concept of risk is the probability of an event multiplied by the magnitude of its consequences. However, as the public and the experts understand risk in different ways, in Sandman's equation, this concept is represented by Hazard, and Outrage is everything which the public is concerned with and experts despise.

Usually, the public has an 'incorrect' perception of the danger as much as the experts have an "incorrect" perception of the outrage. Actually, the error is in the lack of importance that the public gives to danger and the experts give to outrage. In risk communication, if there is no correct approach about what the public perceives as a risk, it will be ineffective. Inevitably, neglecting the public concerns will have a negative effect on the communication process [4, 7].

In a controversy about risk, experts tend to assure that the danger is small, without understanding the reasons for the public's revolt and, much less, without taking providences to reduce it. The problem is aggravated when a justifiable revolt is considered unjustified or negligible by experts [7].

Experts evaluate risks according to the number of people who may die or become sick due to an event. People exposed to risk have a broader consideration of it, one that is not only based on technical data, but defined by values, common knowledge, personal experiences and concerns [10].

*Perceptions of risks can not be neglected or minimized as emotional, unrealistic or irrelevant. Emotions, feelings, and attitudes has as much as—or more—importance to the public than the technical magnitude of the risk [4, p. 48]*

#### **4. NUCLEAR FACILITIES**

The APELL manual does not address the emergency particularities of the nuclear industry. Nevertheless, it doesn't mean that nuclear facilities should not add into their risk management programs a communication initiative with the communities living near their facilities.

Currently in Brazil there are two operating nuclear power plants - Angra I and Angra II, and a third one, Angra III, is under construction. The delivery of the first Brazilian Multipurpose Reactor (Reator Multipropósito Brasileiro - RMB) is expected by early 2018. These initiatives increase the importance of having a good and open communication with the public about the safety of these operations, especially given the general apprehension by the public and the controversial aspect of nuclear energy, which has been exacerbated after the recent Fukushima events.

Without an effective public communication about what means having these plants and nuclear reactors around, the public will be left only with an alarmist view, supported by those against these installations and the use of nuclear energy.

Studies of the Impact of Large Energy Programs carried out by the Interdisciplinary Energy Study Group of the COPPE at the University of Rio de Janeiro, have shown that when the Nuclear Central Almirante Alvaro Alberto (CNAAAA- Nuclear Power plants of Angra I and II) was built in the 1970s at the south Atlantic coast of the State of Rio de Janeiro, the greatest concern of the local and regional public authorities as well as the general public was

the fact that the facilities did not fit the city landscape/context rather than the risks they offered [11].

When the community is prepared and clearly aware of the emergency measures, acceptance and compliance during an emergency are improved. This is important as well for building resilience during the recovery phase, after the incident. The entire range of possible emergency scenarios should be taken into account by the authorities when planning the contingency plan, including the necessity to evacuate an area due to a radiation emergency [8].

In September, 2013, CNAEA did the Emergency Plan General Exercise in Angra dos Reis, where the nuclear power plants Angra I and Angra II are located.

This exercise's goal was to improve and to test the emergency plan's efficacy and to improve its defective points. Happening every other year, the general exercise simulates a fictional scenario of a nuclear accident and comprises the participation of civil and military entities and the region's population, employing all of the infrastructure needed in an emergency situation.

As observer of this year's exercise, it was possible to testify that the institutions involved in rescue, contingency and mitigation of an accident are well aware of their role and prepared to act.

However, if the public isn't further involved and participating, the emergency plan may fail in a real accident scenario. Roger Kasperson has six propositions on public participation and their relevance for risk communication. Among them, "Conflicts emerging in public participation efforts often centre upon means/ ends differences in expectations; a lack of early and continuing involvement is a characteristic source of failure for public participation

programmes; members of the public differ in arenas and scope of involvement, suggesting differing 'thresholds' of involvement and differing communication strategies" [12, p.20,22,25].

Risk Communication, as defined by Morgan [13], is the communication directed towards laypeople with the information necessary for them to have an informed, independent position on risks to the environment and to their own health and safety.

## **5. CONCLUDING REMARKS**

This article presents a review of the main papers resulted from studies on risk communication, specifically the ones stating that the population's access to information on possible dangers and to environmental safety plans is a right and necessity [3]. It also presents the observation of a simulation exercise from the Emergency Plan for the nuclear power plants in Angra dos Reis.

This review supports the understanding of risk communication as a two way process, where it is relevant to know the public perception, to understand their fears, doubts and concerns, and to establish a channel to listen and talk to the public. It is necessary to be honest and to seek the involvement of those concerned, and building up a trustful relationship using appropriate ways and methods is crucial [14].

Risk management has in communication a fundamental basic aspect for the efficiency of response plans to occasional emergencies, aiming for the avoidance or minimization of casualties and damage. Trust relationships, essential to bring different groups together around a plan of action, depend on the quality of the communication processes. Different views and values attributed to the phenomena involved in concrete situations must be acknowledged and respected, so the communication can effectively happen.

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