

Psychological and Social Impacts of Post-Accident Situations : Lessons from the Chernobyl Accident

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Abstract. This paper presents the main features, from the psychological and social points of view, of the post-accident situation in the contaminated areas around Chernobyl. This is based on a series of surveys performed in the concerned territories of the CIS republics. The high level of stress affecting a large segment of the population is related to the perception of the situation by those living in a durably contaminated environment but also to the side-effects of some of the countermeasures adopted to mitigate the radiological consequences or to compensate the affected population. The distinction between the accident and the post-accident phase is enlarged to take into account the various phases characterizing the dynamics of the social response. Although the size of the catastrophe as well as the economic and political conditions that were prevailing at the time and after the accident have resulted in a maximal intensity of the reactions of the population, many lessons can be drawn for the management of potential post-accident situations.

INTRODUCTION

The knowledge of the psychological and social impacts of severe accidents involving radioactivity as well as the comprehension of the mechanisms driving the acceptability of post-accident situations characterized by large contaminated areas were rather limited before the Chernobyl accident. The first attempts in the late eighties to explain the reaction of the population in the affected territories after the accident were superficial. They were founded on the observation that the general public was generally ignorant about the potential effect of radiation, rather suspicious with regard to any official information, largely influenced by media having a strong propensity to spread alarmist news or perturbed by the on-going controversy between experts on the nature and the scope of the measures to be adopted to improve the situation.

Although these various aspects have certainly played a role, they were not sufficient to explain how a high level of stress was dominant in a large fraction of the population living in the contaminated territories in the three affected Republics and leading to a profound social crisis many years after the accident. This paper is first presenting the psychological situation as well as some of the factors that have been identified at the origin of the chronic and acute stress which is still characterizing the situation and preventing a return to normal living conditions from the psychological and social points of view. It is based on the results of a series of studies carried out from 1990 to 1995 in the contaminated areas in Belarus, Russia and Ukraine, first in the framework of the International Chernobyl Project initiated by the International Atomic Energy Agency [1, 2] then within the Evaluation Programme of the Consequences of the Chernobyl Nuclear Accident (Joint Study Project n°2) from the European Commission [3, 4, 5]. The second part of the paper describes the successive steps reflecting the social response during the emergency and the post-accident phases following the accident. This dynamics allows to better take into account the symbolization process driving the social acceptability of the post-accident situation. Finally some considerations for improving post-accident management and restoring social trust in the affected population in case of future accidents are presented in conclusion.

THE PSYCHOLOGICAL SITUATION

Ten years after the Chernobyl accident, any well informed observer can notice that a large anxiety is still existing among the population living in the contaminated territories around Chernobyl. Quantitative studies on the psychological and social effects carried out in 1992 and 1993 [3, 4] highlight an acute feeling of lack of control over individual living conditions clearly linked to a high level of psychological distress in the affected population. This anxiety is essentially related to the potential effect of radioactivity on health and particularly the one of children. Without being able to verify the accuracy of their allegations, interviewed persons are mentioning an abnormal number of somatic effects which are all attributed to the ambient contamination. This last one is a permanent concern for the population who seems in the impossibility to forget the accident and its real or supposed consequences.

As early as 1987, a few Soviet experts have put forward the rather confusing notion of radiophobia to try to explain the psychological reaction of the population. This notion was a convenient explanation for the fears noticed by many individuals inside the population, fears being considered groundless by the experts taking into account the prevailing radiological conditions. The investigations carried out in the contaminated areas have demonstrated that questioned people were expressing fears always supported by rational speeches on the basis of their observations related to the situation [5]. It is difficult to conceive how the concept of phobia, which in psychiatric terms means an unfounded and irrational fear concerning objects and situations that are not in themselves hazardous, could apply to a situation where on the contrary, there were objective reasons to be anxious. It is also interesting to note that this hypothesis of radiophobia, which is now definitively abandoned, received initially a large echo at the international level among experts dealing with the consequences of the Chernobyl accident to explain the attitude of the population in the contaminated areas.

Over the recent years, the concept of chronic and acute stress has progressively emerged to explain some of the symptoms to be observed in the affected population. This stress, which meaning is different from the one given in media and everyday language, can be described as a «continuing inability to adapt at the biological, psychological and social levels. The body, the nervous system and the psychology of those affected enter a state of alert or excitation involving a permanent expenditure of energy. The result is bodily dysfunction and pathological effects manifesting themselves both organically and psychologically (extreme fatigue, insomnia and depression)... A characteristic of the stress situation is that habitual, regular and familiar responses are dislocated, and that the subject is unable to find satisfactory solutions to the problems with which he or she is confronted» [6]. In the post-accident context of Chernobyl, this stress is observable in all groups affected i.e. the re-settled population, the one living in the contaminated areas and of course the liquidators. The anxiety mainly focuses on health, and particularly on the health of children, with a constant reference to somatic disorders. There is also a great concern of the population about its future with the conviction by many people that the situation is not going to improve with time but on the contrary can only get worse thus reinforcing their fatalist and passive attitude.

Many stress factors have been identified which are closely linked with the management of the accident and post-accident phases of the Chernobyl accident. To better understand some of these factors it is useful to distinguish between the Soviet period of the accident management from 1986 to 1990 and the national period with the takeover, from 1991, of the post-accident management directly by Belarus, Russia and Ukraine.

The first period is characterized by the relative failure of the protective measures adopted. Evacuations and iodine distributions were often organized too late and the population affected by the radioactive releases received in some circumstances very high doses. This is in part explaining the growing number of health effects over years that have been observed reinforcing the fear of the population. The context of secrecy and censure which prevailed during this period also largely contributed to the development of distrust towards the authorities. Globally the accompanying symbolization process which normally follows an

accident did not take place and the population has attributed all the negative consequences of the accident to the remaining contamination. The occultation of the importance of the accident and of its potential delayed effects by the authorities associated with the fact that the population was permanently confronted to lasting countermeasures led to over-amplify the risk of the post-accident phase. Furthermore, the presence of about 800,000 liquidators disseminated among the general population was a supplementary factor of disturbance. Their greater vulnerability from the health point of view reinforced the distorted perception of the situation as regard to the potential effects of the residual contamination and contributed to maintain or even increase the level of stress in the general population.

The second period has been fundamentally characterized by the willingness of the national authorities to differentiate their management from the previous centralized one by adopting a more realistic and democratic perspective. However, the emphasize put on the defense of the victims of Chernobyl has mainly focused the attention of the new authorities on the post-accident situation. The various national laws adopted by the Republics in the early nineties have established rather generous compensation systems which were supposed to be financed by the Russian Federation. Besides the fact these systems have never been properly financed, they have established a close link between the level of contamination of the environment and the level of compensation thus reinforcing the idea that the risk is first associated with living in contaminated territories. As a consequence, the population many years after the accident tends to attribute all the problems it is facing to the residual contamination and the general feeling is that difficulties will even grow with time. It is evident that such a perception of the situation is a powerful factor for reinforcing the general stress of the population as well as a mental trap to which it is difficult to escape. One can also understand the devastating impact of a lack of objective information on the potential consequences of a large nuclear accident in the early phase and even before.

Another important stress factor is the loss of trust of the population in the scientific, medical and political authorities. Beyond the negative impact of the lack of transparency of the authorities at the time of the accident, the on-going debates on the criteria for establishing countermeasures as well as on the potential health effects associated with the remaining contamination have slowly turned the situation into a very complex one where individuals did not trust anymore experts and felt totally insecure and unable to contribute to resolve the problems themselves. A general feeling of loss of control is thus reinforcing the climate of social distrust.

Observations in the contaminated areas have also shown the paradoxical effects, from a psychological point of view, of many of the countermeasures adopted. The zoning of the contaminated areas has induced a ghetto effect leading to a loss of identity of the population and some forms of exclusion. The definitive resettlement was a strong factor of stress because in most cases the area of relocation was imposed without taking into account the social and cultural affinities of the relocated persons. Moreover, the conditions of relocation into blocks of flats in urban areas was also creating a ghetto effect installing the relocated population into a social status of «Chernobylites». Finally, the compensation system also contributes to develop jealousy in the non compensated population and a reinforcement of the segregation with those affected who are feeling more and more isolated.

It is worthwhile, to complete this rapid overview of the psychological situation, to mention the situation of the few hundreds of persons called the «samossiols» who were initially evacuated at the time of the accident and despite administrative interdictions, came back in the thirty kilometer zone to stay again in their own houses. These generally old persons who are living in a hostile environment and in poor material conditions seem to be in a better psychological situation than the population living in the other contaminated areas. Their willingness to live as before without the financial support of the state can be interpreted as a positive factor to restore their autonomy and thus could explain a lower level of distress than the one observed in the territories affected by the accident.

THE SOCIAL DYNAMICS OF ACCIDENTS

From the accident management point of view, it is usual to distinguish two main phases: the emergency one which is following immediately after the accident and during which a series of actions are implemented according to plans prepared in advance, and the post-accident phase during which countermeasures are adopted along the justification and the optimization principles taking into account the specificity of the situation resulting from the accident. This simple scheme does not reflect properly the dynamics of the accident from the point of view of the reaction of the population. In the perspective of better taking into account the psychological and social dimensions, it is worthwhile to envisage a more detailed sequence characterized by the collective behavior of the population directly affected by the accident as well as the rest of the population which can be observed each time a large accident or a catastrophe occurs [7].

The sequence generally starts with the implementation of emergency measures planned in advance. The level of preparation including the information of the public is an essential element for the success of this phase which perception is largely influencing the next ones. This reflex phase is followed by a strong reaction expressed by both the affected population and the general public. Besides an inevitable feeling of revolt which normally turns rapidly into a social debate about negligence and responsibilities about the causes of the accident, heroic actions to save persons or to eliminate remaining acute dangers reinforce a strong feeling of solidarity by identification to the victims especially among the non directly affected population. Past experiences with large industrial accident or natural disasters show that during this rather short period, the affected people as well as the society as a whole are able to endure exceptional constraints and particularly to face much higher levels of risk than in normal situations.

The heroism phase is normally followed by a transition period during which a set of technical and administrative measures are implemented with the objectives to control the residual risk for the population, to repair if necessary the physical and health damages or to restore the general environment and to reorganize the social activities. This phase can be compared to a convalescence during which society is recovering progressively and return to a situation considered as normal. Parallel to this evolution, the symbolization process around victims is engaged to allow the construction of a collective memory indispensable to reaching social acceptance of the accident and its consequences. This last dimension is very similar to a mourning process involving both the affected population and the society as a whole. It is important to note that the compensation of victims for the damages they supported is part of this general process of symbolization and it is therefore important to properly assess the various losses of each affected individual. In this perspective, the reconstitution of doses received by each individual at the time of a nuclear accident is a key element to objectify the risk and to set up an effective compensation system.

The return to normal living conditions after a large accident affecting a society is a complex process involving a rearrangement of the mental representations of most of the affected people and in some severe cases the establishment of a new social regulation to overcome the discredit of the old system which failed. The success of this process is not only depending on technical measures but heavily rely on the ability of authorities to restore as soon as possible social trust in the society and particularly some confidence with regard to experts and authorities. The return to normality expression must be well understood and used properly. By no means it is a return to the situation that was prevailing before the accident. This is impossible in most cases and particularly after a large nuclear accident followed by a durable contamination of the environment. The objective is to restore a situation where those involved can again focus their attention to their individual day-to-day activities and plans in a context of vigilance towards the ambient contamination. This does not mean that society behaves like nothing has happened, but on the contrary that the consequences of the accident have been fully integrated at both the rationale and symbolic levels, are taken into account in the day-to-day behavior of the population and finally serve for the whole society as a learning experience for the future.

The above described evolution is ideal. In reality some of the key factors for restoring the situation cannot play their curative role and it is even possible that, as it was the case with the Chernobyl accident, a post-accident crisis is taking place due to the rejection of the situation by the affected population. The mechanisms leading after the solidarity phase to a non-acceptance of the situation and then a revolt are not completely identified. At Chernobyl, the high level of stress in the population has certainly played an important role but there was also a conjunction of other factors going far beyond the psychological dimensions. It is evident that the social, economic and political context was extremely favorable as well as the very poor level of information and preparation of the population with regard to a potential nuclear accident. Interviews in the population around Chernobyl and in the contaminated areas have shown that the accident was simply not possible in the mind of people.

It is evident that the intensity of the accident and the extent of its consequences in terms of the number of persons having received high individual doses, the surface of the severely contaminated territories, the number of people to be relocated and the economic cost to try to restore a tolerable situation have contributed to rapidly build a collective representation closer to a disaster and a catastrophe than a large accident. It is not by chance that the population in the contaminated areas is speaking about the accident and the post-accident phase with a lot of words coming from the war vocabulary.

PERSPECTIVES

Although still limited, the analysis of the post-accident situation at Chernobyl allows to delineate some elements first for designing better communication with the public in case of an accident and, secondly, for establishing criteria and strategies for setting up protection objectives and selecting countermeasures which should be compatible with the progressive restoration of social trust among the affected population.

The Chernobyl experience has demonstrated that beyond a certain level of contamination of the environment, the situation is not manageable and it is necessary to relocate the population and to abandon the concerned territories. This is of course true when the level of exposure of the population may lead to the appearance of deterministic effects but also when it is impossible to maintain the integrity of the basic social functions. At the opposite of these unacceptable situations, it is possible to define a level of residual contamination below which the risk can be considered as negligible. This situation must be characterized by the total absence of restrictions on the day-to-day life to allow the population to slowly forget the accident and its consequences after the process of mourning and symbolization leading to a certain form of return to normality.

Between these two situations (unacceptable and negligible), the population is facing a large spectrum of situations that can be qualified as tolerable. They are characterized by the existence of more or less severe restrictions on normal living conditions affecting the production, the distribution and the consumption of goods as well as the social organization related to education, the health care system or the collective leisure activities. Some of these constraints (countermeasures) which are implemented to last on rather long periods need to be adjusted with time and must be accompanied with an effective and independent structure of surveillance and control of the contamination to insure the transparency of the measurements of the residual contamination. This is a very important element to objectify the level of risk as well as to decide about the actions to be adopted. Transparency must also prevail as far as the effectiveness and the cost of countermeasures are concerned.

The main difficulty with the management of post-accident situations concerns the establishment of criteria expressed as numerical values that could serve as reference to define the negligible, the tolerable and unacceptable levels. Various considerations have to be taken into account to elaborate these criteria. The Chernobyl experience is clearly demonstrating that it is impossible to set up reference values for structuring decision making processes related to the post-accident management without referring to those which are universally adopted for the protection of the public and workers in normal situations. Furthermore, the control of exposure

in the contaminated areas necessarily involves to take into account the diversity of sources and in this perspective it is extremely difficult to envisage centralized and generic measures that could be applied to large areas. The implementation of a decentralized approach relying on the commitment of those directly affected by the accident seems to be the most effective way of attacking the problem.

The Chernobyl experience has also revealed the complexity of managing post-accident situations with the need to reconcile the radiological protection imperative with the various psychological and social dimensions. Taking only into account the radiological considerations may lead to a difficult situation because of the perverse effects of many countermeasures which are reinforcing the feeling of exclusion of the affected population and maintaining the doubt on the risk really at stake. At the opposite, giving priority to the psychological factors may involve serious consequences from the radiation protection point of view if the population is not fully aware about the exposure pathways and the mechanisms through which it is possible to control exposures. Observations have been made over the recent years confirming that the doses received by some part of the population living in the contaminated areas were increasing because of a lack of precaution or even in some cases of a denial of the potential impact of the contamination.

The main difficulty for restoring normal living conditions in contaminated territories is to build collective modalities to cope with the radiological residual risk in order to lead progressively to an acceptable situation from the psychological and social points of view. The success of this approach largely depends on the capability to set up an individual and collective management of residual risk, in spite of the implementation of long lasting countermeasures. Anticipating a benefit, the involved persons must be in a position to actively and voluntarily manage the level of their exposure taking into account the specific situation they are facing. From a collective point of view, adequate means to control the risk must be available: concepts, assessment tools, equipment, budget... Such an approach is at the opposite of the one which inspired the various systems implemented so far in the affected Republics where the persons exposed to the residual contamination are compensated for the risk they take and not for the one they contribute to avoid for themselves and the others. Furthermore, these compensation schemes reinforce the existing risk by objectifying it in financial terms and perquisites.

In practice, the adoption of a pro-active approach involving the commitment of the concerned population should result in the implementation of an ALARA type process close to the day-to-day activities of the population (at schools, in the plants, within families, at the farm level...). This decentralized approach should be implemented in the framework of a more global system ensuring the coherence and the rationale use of the material and financial support indispensable to restore satisfactory living conditions. An independent system for controlling the situation, particularly the contamination of food products and the close environment of the population, should also allow to facilitate the restoration of a climate of social trust within the population with regard to the experts and the authorities. Such mechanisms must rely on solid ethical basis clearly displayed in view to establish the transparency of the decision making processes and the responsabilization of all concerned actors and primarily the affected population. To respond to the question: Is it possible to live here? it is inevitable to begin with a true characterization of the situation in term of risk which is the first element to develop a commitment to the situation with a protection culture based on the responsibility of each individual to the risk he or she is going to take freely and voluntarily.

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