ADJUSTING ABILITY AND SENSIBILITY IN CASE OF AN ACCIDENT

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ABSTRACT

Adjusting ability (technical competence) and sensibility (consciousness) are the two most important tasks that any staff member, part of any organization, should realize while acting during a nuclear or radiological emergency.

This document comments on the above two tasks and draws the attention of national authorities, non major power reactor programme, and in special IAEA and WHO for the fact that, nevertheless 10 years were lapsed, the lessons learned from the radiological accident in Goiania, were not fully learned. In particular the astonishment of the population and the lack of understanding on what had happen and what should be done, gave birth to a very complex psychological impact and discrimination.

Attention needs to be done by national and international bodies to the education and training of competent authority staffing of developing countries to promote its organizational capacity to achieve the Safety Objectives Principles of Nuclear Installations and the Safety of Radiation Sources [10,11]. However, not only in the improvement of the quality of safety and radiation projects to control the uses of radioactive materials in the field of medicine, agriculture, industry and research [9], it is also necessary to assist those countries, non major power reactor programme, to the aim of an objective and realist training to respond emergency, connecting both situations: Ability and Sensibility.

Key words: developing country, model project, realistic training, lessons learned

INTRODUCTION

In September 1987, the removal of the rotating assembly of the shielding head of a Teletherapy unit and the dismantling of the capsule containing 50.9 TBq (1375 Ci) of Cs-137 led to the most serious radiological accident to have occurred to date. It resulted in the injury by radiation of many people, four of them fatally, and in a widespread contamination of the central sector of Goiania, a Brazilian City of one million inhabitants. Goiania is the Capital of the State of Goias, 180 km from Brasilia, Capital of Brazil. This radiological accident was singular, because it happened in the urban zone, center of the town. The accident presents’ lessons that cover the pre-accident phase, the emergency phase and the post-accident phase up to the present, ten years later and, in each of them, were found mistakes and correct actions from individuals and organizations[1,2,3, 4].

Today, besides the medical treatment to the patients (groups) in observation, also the Repository Site storing 3,500 cubic meters of waste, in more than 6,000 containers, still involves social and economical concern and psychological emotion, among the population at the neighborhood of the site, Abadia de Goias, 20 km from the town [5]. This radiological accident, in view of such singularity, unique in the world, brought to
light several adverse indicators not observed in publications relating to emergency planning and preparedness. Were learned in Goiania, dealing with all classes of the regional society, that not only economical, political and technical problems we had to deal with, but also social and apprehensive psychological aspects, as fear and depression of the population and stigmatization and discrimination against the victims and the main products of the city [6,7,8].

This paper also considers the public and professional perception and conflicts of information, distortion and misunderstanding, as the main root for the anxiety and discrimination situation. Finally it is mentioned several psychological questions in the early phase of the accident not foreseeable that one does not learn in the literature, but suddenly come face to face through unexpected situations or questions, that we never thought about and that must continuously be analyzed in terms of Safety Culture Problems Identification and Safety Culture and Human Behavior [7]. As last remark, this paper alert national and international organizations, specially those ones devoted to the progress of developing countries, as IAEA and WHO that \textit{the lessons from this radiological accident, until now were not yet enough discussed and learned.} The author emphasizes to those organizations, if another scenario like Goiania will happen anywhere, in developing country, probably the entirely personages, competent authority, organizations, media, will repeat again the same mistakes, and this will not be good for the progress of nuclear energy.

Considering countries with power reactor programme, or even without power reactor programme, but frontier with those countries, the accident of Chernobyl is the maximum example of lessons learned. However, considering developing countries no major power reactor programme, specially those ones in the process of establishing or improving the national radiation safety infrastructure to assure public health and safety and no boundary with countries with power reactor, the Radiological accident in Goiania, in each step, is the greatest laboratory to train how to deal in case of an emergency involving technical and political conflict, as well as, sentiment of the population, object of this paper. What policies and measures are developing countries preparing now to take into account response to radiological accident, considering social and psychological impacts?

**UNDERSTANDING FEELINGS: QUESTIONS AND EMOTIONS**

**Public & Professional Perception**

Unexpected the population in Goiania had a terrible unpleasant experience: like a bad dream, was involved in a radiological emergency response, not as an exercise, but in a realistic accident scenario. Suddenly also the media, national and international (in the initial phase, mainly), arrived in Goiania to remain for long stay. Expressions and jargons that the population never heard before about risk, hazard, threshold, stochastic, non-stochastic and many other's, as units: Becquerel, Sievert, appeared every day in polemic discussions and in the media. Among these confuse words' one was well known by everyone: cancer. This led to conflicts of misunderstanding information among organizations, population and media.

The main difficulty arose in establishing the right balance to provide information promptly and assuring accuracy and coherence. The ignorance and limitation of the population expanded the emotions beyond the reasonable. How could one expect another psychological reaction from the population in Goiania? They suddenly observed hundreds of professional, from the nuclear field and others’ organizations, taking upon themselves the control of houses and
streets and, for the first time, continuously listening:

- Ionizing radiation is an invisible enemy;
- Ionizing radiation is dangerous to life;
- All radioactive materials and radiation are potentially hazardous;
- Evidence and experience indicate that limited exposure to external radiation or intake of small amount of radioactive substance into the body, are associated with negligible probability of severe somatic or genetic injury;
- Mutations, have once occurred are permanent. The great majority of observed mutations are permanent;
- The effects of large doses of radiation on human health are well understood and such doses are clearly hazardous;
- The low doses delivered over period of months or years provoke risks of malignant diseases, as leukemia or cancer that may appear years or decades after exposure.

Until now, ten years later, the population and the media in Goiania still do not understand very well the above expression and still repeat many questions regularly, not enough clear in their mind, like these:

- How long will it take to feel consequences?
- What are the effects on children and women?
- What are the effects on future generations?
- $10^{-6}$ but not zero?
- What is exactly the meaning of small quantity, small amount or low level?
- I do not understand: Mi what? Bec what? Si what? Sto... what... (refer to mili, Becquerel, Sievert, Stochastic, Non-Stochastic and others unusual words to the population ¹
- Whom should I believe? Do you swear?
- Who is right? Who is exaggerating?
- How do we know whom to trust?

Special population remarks:

- If there are scientific controversy about low doses and high doses are dangerous, where we are in this context?
- I do not understand what are you talking about.
- Please could you repeat it once again?

Understanding the Relevance of Emotions

The intensity and confusion of the emotions engendered by this accident. Increase the reasons for the public attitude, specially to those who suffered from the effects of contamination, evacuation and losses. In considering the whole range of psychological consequences, these aspects must be noticed:

- Physical and emotional pain cannot be measured objectively, specially when urgent protective measures take place, at early phase of an accident, and certainly to those part of the population under the impression that they are being rejected by certain attitudes of exclusion and discrimination;
- Lack of an adequate expert knowledge, due the lack of an appropriated system of education and information was the main cause of discrimination and stigmatization against the city and individual;
- Lack of an adequate psychologist expert mediators to balance misinformation and criticism of the authorities, was also reason for the psychological consequences, related with anxiety and stress, expanded

¹ For the population nuclear spokesperson express by means of abstract words
in the population, which increased by the loss of confidence of the directly affected persons in the authorities and in the governmental medical support;

LESSONS LEARNED:

• Implausible Accident can happen suddenly, even when least expected, like Juarez, Goiania and Chernobyl;

• Accident caught countries by surprise, (Chernobyl and Goiania)

• Emergency Planing and Preparedness is still in incipient stage in the great majority of developing countries, no major power reactor programme;

• The distress caused by the misperception of radiation risks was extremely harmful to people and to the economy of the State of Goias. It just happens to be a problem that scientists think and speak in their own language, using their own terminology, which was not understandable by the highest percent of the population;

• It is vital to beware the dangers of not applying the lessons of the Radiological Accident in Goiania in countries no major power reactor. The Radiological Accident in Goiania ended ten years ago, however many technical, political, economic, social and psychological lessons should still be analyzed and learned, before any other similar accident takes place. What can be done now to limit recurrence in the future?

REFERENCES


