



*The Human Dimension of  
Nuclear Post–Accident Situations*

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*This presentation has neither been approved nor endorsed by ICRP*

# Introductory remarks (1)

- **Any severe accident is a breaking point in the day to day course of events**
  - This is a **bifurcation point** that threatens the operation and values of society at the individual and collective levels, with strong stakes including the integrity of property and life, which implies the need for **urgent actions** often in a degraded situation (e.g. lack of information) and which takes place under great **psychological stress**
  - After the acute phase there is usually a period of decline and **resolution of the crisis** marked by phases of **solidarity, mourning** and integration of **lessons learned**, that gradually lead to the return to normality with a new social equilibrium
- **Nuclear post-accident situations have specific characteristics which prolong the crisis**
  - The nuclear accidents at Chernobyl and Fukushima show that the **lasting presence** of radioactivity in the immediate vicinity of the affected population is a powerful factor which maintains the tensions caused by the crisis, prevents its resolution and generates a lot of **stress** within the population

## Introductory remarks (2)

- **The presentation is an attempt to describe:**
  - The **human characteristics of living in a contaminated area** after a nuclear accident
  - The **effects of the technical management** of the consequences of the accident **on the affected population**
- **It is based on observations (empirical approach) collected through the experiences of:**
  - Chernobyl in Belarus: 40 missions = 11 months in contaminated territories between 1996 and 2008
  - Fukushima in Japan: already 10 missions mostly in relation with the ICRP Dialogue Initiative in Fukushima which started in October 2011

# Living in contaminated areas (1)

## The radioactive contamination is a disquieting presence

- Invisible, impalpable, uncatchable
- Everywhere in the environment and living places
- Intrusion in the private sphere
- Long lasting: several generations
- Difficult to understand for non specialists
- Raising a lot of questions and concerns in the population particularly among mothers with young children
- Reinforced by the extent of the social mobilization
- **Generating anger, anxiety and in some cases depression**

# Living in contaminated areas (2)

## An unspeakable presence

- Unknown by most people
- **No past experience, no memory**
- **No words in the common language** (the jargon of experts is incomprehensible to ordinary people)
- Faced with radioactivity, people do not know how to express the fear of danger
- The lack of experience and words to apprehend radioactivity led to all sorts of odd representations and to the development of a profane knowledge on the effects of radiation and how to protect oneself

*Thus, in Chernobyl, where the population has long been without information, a few years after the accident, recipes circulated to protect or to decontaminate oneself, such as eating cabbages or drinking vodka*

## Living in contaminated areas (3)

### All dimensions of daily life are affected

- Psychological, emotional, symbolic, ethical and aesthetic at the individual level
- At the collective level : health, environment, social life, production, distribution and consumption of foodstuffs and commodities...
- **Everybody is affected** : residents, local authorities and professionals, local organizations and businesses, but also national stakeholders (authorities, experts, the general population ) and abroad

## Living in contaminated areas (4)

**For each individual, the presence of radioactivity modifies her/his relationship to risk**

- General feeling to be confronted to a danger without the ability to put the risk in perspective
- As a consequence everyone is envisaging the worst and faced with the thought of death
- **Radioactivity updates death** that normally is pushed (repressed) as a contingency affecting others first, the sick and those who take risks

## Living in contaminated areas (5)

**For each individual, the presence of radioactivity modifies her/his relationship to other people**

- A difference is immediately settled between those who have been affected and those who have not been affected
- A permanent worry: how unaffected individuals perceive me? How to behave with those who are affected? What to say and not to say?

*(In Chernobyl children evacuated from contaminated areas were placed at the bottom of the class in village schools where they were relocated. Young people of uncontaminated territories often admitted that they did not want to marry someone from the affected areas)*

- Having been exposed to contamination makes people foreigners
- **Residents of the affected areas feel strongly discriminated**



## Living in contaminated areas (6)

**For each individual, the presence of radioactivity modifies her/his relationship to the land**

- Familiar environments such as garden or recreational areas become hostile
- The affected areas are disqualified on the social and economic levels (land and agricultural losses). Goods and products have less or no value anymore
- The natural heritage is also disqualified: contamination of flora and fauna, rivers, lakes,...
- Affected people have a different vision of landscapes and symbolic sites as before the accident. This can turn in hatred of the affected area
- This disqualification is confirmed administratively through the zoning
- **The common heritage is devaluated**

## Living in contaminated areas (7)

**For each individual, the presence of radioactivity questions her/his relationship to the collective memory of the nation**

- Everyone turns to the memory and History of the country and of the affected areas to find a way of thinking the event
  - *Chernobyl: World War II with the deportation of Jews but also the Gulag*
  - *Fukushima: Hiroshima and Nagasaki, the cold war and the atomic bomb tests (The Lucky Dragon affair)*
- This work of memory participates of the mourning process necessary to accept that the world before is irremediably lost, that **there is a 'before' and 'after' the accident**

## Living in contaminated areas (8)

**Individuals find themselves immersed in a new reality and at the same time they feel excluded. This exclusion is the result of a double movement:**

- Firstly because of the lack of experience people do not know how to grasp this new reality and do not know how to react and act. They feel excluded
- Secondly, **the management of the situation by the authorities and experts only strengthens this feeling of exclusion.** Protective actions implemented by authorities disrupt daily life

# Effects of the technical management (1)

## Contamination measurements reduce everything into figures

- Measurements of radioactivity to reveal the presence of radiation reduce the particularities and qualities of all measured things (including food products and even the human body) to a single physical dimension: the amount of energy emitted by radioactive atoms present in these things
- As a consequences, **the relationship of individuals to the surrounding reality is progressively replaced by figures** that deplete the apprehension of things and re-enforce the feeling of exclusion of individuals from this reality

## Effects of the technical management (2)

Radiation protection standards divide the world between what is allowed or not and what is “good” and “bad”

- Under normal circumstances, standards for public protection define **the space of quietude**, i.e. the space in which everyone can go about her/his business without concern or worry because the situation is by definition under control. They also allow to identifies deviations related to the normal state which remain exceptional
- In post-accident situations, standard qualify the places, products and even people. Doing so they also assign those directly involved in the situation or who are holders of the product, on the good or on the bad side.
- **Setting standards in post-accident situation is a delicate process because it not only disqualifies the environment and things, but also individuals**

# Effects of the technical management (3)

## Protective measures

- Protection actions aim at putting people away from radioactivity or reducing the levels of radioactivity in the environment and food products, where human presence is tolerated
- In a context where the mere presence of radioactivity, people feel excluded with no real ability to control the situation, **the introduction of protection actions strengthen the feeling of exclusion**
- The individual is seized and it becomes a cog in a mechanism that does not depend on him
- For many people, the implementation of protection actions, especially those that fundamentally change the traditional relationship with the environment, is seen as a second accident

# Effects of the technical management (4)

## The characterization of the radiological situation

- Characterization of the radiological situation is a prerequisite to regain control of exposures. The objective is to evaluate the magnitude of exposures
- This is generally done based on a series of models combining ambient dose rate and foodstuff contamination measurements with parameters describing the behaviours of the affected population
- Beyond introducing large uncertainties, such modelling and statistical approach levels the individual differences and does not allow people to make a connection between their behaviour and the doses they receive, thereby **depriving them of benchmarks for action to protect themselves**

## Effects of the technical management (4)

### The difficulties to manage the situation leads everyone to look for scapegoats

- Authorities and experts are communicating with scientific and technical arguments to answer to the worries and interrogations of the population
- These arguments are generally not understood by the people who persist in their questioning, in particular concerning the risk of radiation
- Facing this situation authorities and experts tend to put the blame on the population and adhere to the so-called **'theory of radiophobia'**
- The affected population accuses public authorities of unpreparedness, delays, misunderstanding but also mismanagement, negligence or even abandonment
- This can contribute to amplify **social distrust** and lead to very difficult situations to manage (cf. the Soviet Union situation in the late 80s)



## In summary (1)

### The human consequences of nuclear post-accident situations

- Loss of confidence in authorities and experts
- Strong worry about the future and especially of children
- General feeling of exclusion
- Feeling of helplessness and abandonment
- **Loss of control on daily life**

Finally, each individual is permanently confronted to the questions:

- **“Should I stay or leave the area?”**
- **“Should I return or not?”** (Those who left or have been relocated )

## In summary (2)

### Attitudes of the affected population facing contamination (Chernobyl 10 years after the accident)

- **Denial of the risk:** people refuse to see the complexity of the situation and convince themselves of the absence of risk (theory of immunization). The most frequent one
- **Resignation and fatalism:** people give up to face the situation and settled themselves into apathy and a victim status
- **Strong concern and anxiety :** people are fully aware of the situation but do not know how to manage it. Young mothers particularly
- **Positive behaviour:** people decide to develop self-help protection actions. A very small minority

**All these attitudes are 'strategies' aiming at reducing the level of stress. Denial and resignation generally lead to risky behaviours for oneself and the family.**

## Concluding remarks (1)

- The irruption of radioactivity in the daily lives of people **deeply upsets the relationship of man to himself, others and his environment.** It is a new reality that **enters the human condition**
- Living in a contaminated environment is a **complex situation generating a lot of questions and concerns** among the affected population
- Overall, the technical response to improve the situation, generates **side effects which contribute to depersonalize the individual and strengthens its exclusion and the foreign character of the world.** It also contributes significantly to the degradation of social trust in the authorities and experts

## Concluding remarks (2)

- Top-down, centralised, prescriptive and normative approaches are effective in emergency situations. They are inadequate for the management of contaminated territories because they generate:
  - **A dependency status** within the affected population
  - **A phasing out** of personal initiative
- In such a context the objective is not only the protection of people against the potential health effects of radiation, but also and above the **rehabilitation of sustainable living conditions including respectable lifestyles and livelihoods**

## Concluding remarks (3)

- The Chernobyl experience has shown that the lack of direct engagement of the affected people in regaining control of their radiological situation and in the rehabilitation of their living conditions inevitably leads to a shared feeling among them of **loss of control over their daily life, disqualifications of their living places, exclusion and abandonment of the rest of the world and also a deep and persistent mistrust vis-à-vis experts and authorities**
- Despite a very different context, especially regarding access to information, the situation at Fukushima nearly three years after the accident presents many characteristics similar to the Chernobyl situation albeit with a smaller amplitude

## Concluding remarks (4)

- How to reduce the complexity characterizing a post-accident situation?
- How to avoid the perverse mechanisms introducing distrust, and loss of confidence of the population?
- How to avoid lassitude, renunciation and de-mobilization of the population?
- Addressing these challenges is not only a matter for science and technology. It is also **a human problem calling for respecting the fundamental values of liberty, autonomy and dignity of the affected people**

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