My experience with the post-accident situations of Chernobyl and Fukushima

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Introduction
- From economics to radiological protection -

• I was born in 1950 in Montbéliard, a small city in the East part of France close to Switzerland
• After primary and secondary studies in my home town where I graduated in natural sciences I joined the regional University of Besançon in 1968 to study economics where I received a Master of Science in 1972, and then the University of Paris-Sorbonne where I received a Master of Advanced Studies in Economics in 1974
• I started my career as teacher of law and economics in high schools in the Paris suburb in 1975
• Then, I joined the Nuclear Protection Evaluation Centre (CEPN) as researcher in 1977, a non-profit organisation created in 1976 to develop research and studies in the fields of optimisation of radiological protection and the comparison of health and environmental risks associated with energy systems
The optimisation principle: from theory to practice

• At CEPN I first worked on the theoretical and methodological aspects of the cost-benefit model proposed by the International Commission on Radiological Protection (ICRP) to implement the principle of optimization of protection which aims to keep exposures as low as reasonably achievable taking into account economic and societal factors (Also called ALARA principle).

• I then worked on the practical implementation of the principle in nuclear installations, first for the protection of the public from the radioactive discharges of the installations in the environment and then for the protection of workers inside the installations.

• During the 1980s I mainly contributed to the setting up of analytical tools and procedures to improve the protection of workers engaged in maintenance works at French nuclear power plants. In this context I participated to many maintenance operations in nuclear power plants.
The Chernobyl accident: 26 April 1986

• Initially the accident had no influence on the CEPN work program because it was considered at the time as a matter of nuclear safety and this was not part of the scope of the research group.
• The accident caused much debate in the French society on the future of nuclear energy and the attitude of the authorities towards the public, but the question of the consequences for the populations of the affected areas in USSR was never addressed.
• In July 86 I was promoted Project Leader and then appointed Director of CEPN in March 1989.
• Only a few weeks after I received an invitation from the European Commission to participate in the International Chernobyl Project in order to carry out a cost-benefit analysis on the relocation of residents of villages close to the 30 km exclusion zone around the Chernobyl plant.
• Despite my great ignorance of the Chernobyl situation I responded positively to the Commission. In retrospect, this was a turning point in my career.
In October 1989 the International Atomic Energy Agency (IAEA) received a request from the Government of the USSR to organize and co-ordinate an assessment of the guidance given by the Soviet authorities to people living in contaminated areas around Chernobyl, and to evaluate measures taken to protect the health of the population.

The response to this request called upon the services and assistance of around 200 scientists from 25 countries (including USSR).

During a year these scientists analysed the situation in the three affected republics: Belarus, Russia and Ukraine.

An International Conference was held at the IAEA headquarter in Vienna in May 1991 to present the results of the Project.
The International Chernobyl Project (2)

- My first mission in USSR took place in July 1990. I met with Soviet experts in various institutes in Moscow, Kiev and Minsk.
- I also visited ‘Polesskoe’ a village North of Kiev adjacent to the 30 km exclusion zone. There, I discovered the situation of the population.
- I participated in 3 other missions between July and November 1990 to gather information and to attend decision conferences organized in the 3 Republics with authorities and experts.
- Finally the work was completed and published as Annex of the final report of the Project under the title: Countermeasures to be Taken After 1990 to Ensure Safe Living Conditions for the Population Affected by the Chernobyl Accident.
THE INTERNATIONAL CHERNOBYL PROJECT
TECHNICAL REPORT

ASSESSMENT OF RADIOLOGICAL CONSEQUENCES
AND EVALUATION OF PROTECTIVE MEASURES
REPORT BY AN INTERNATIONAL ADVISORY COMMITTEE
In the train between Kiev and Minsk, July 1990

- Following the International Chernobyl Project, the European Commission proposed an ambitious Collaborative Research Project to the Republics of Belarus, Russia and Ukraine to study in depth all the consequences of the Chernobyl accident.
- I participated to the European team that negotiated the Project and then served as scientific and administrative coordinator of the Joint Study Project n°2, one of the 16 topical research areas of the whole project which was involving more than 200 researchers and experts.
- JSP2 general objective was to develop a decision aiding system for the management of post-accident situations. Part of it was to characterize and possibly quantify the psychological and societal consequences of the accident.
- 24 organisations from Western Europe and the CIS were involved in JSP2. I went 5 times between April 1991 and March 1996 in Belarus, Ukraine and Russia for chairing coordination meetings.
The Joint EC/CIS research project

European Commission
Belarus, the Russian Federation, Ukraine

International scientific collaboration
on the consequences of the Chernobyl accident
(1991-95)

Joint study project No 2

Decision aiding system for the management
of post-accidental situations

Final report
EUR 16534 EN
The main findings of JSP2

- The results of JSP2 were presented at the First International Conference of the European Commission on the Radiological Consequences of the Chernobyl Accident held in Minsk, Belarus, on 18–22 March 1996
- The JSP2 investigations revealed that, almost 10 years after the accident the situation of the population was characterized by:
  - A loss of confidence in experts and authorities
  - A strong concern about the presence of contamination and its potential health consequences
  - A general feeling of loss of control on daily life, exclusion and abandonment
- In conclusion, in order to overcome this situation, JSP2 was suggesting to develop approaches to directly involve the population and local authorities and professionals in the improvement of their living conditions in the affected territories
The radiological consequences of the Chernobyl accident

Editors
A. Karaogiou, G. Desmet, G. N. Kelly and H. G. Menzel
The ETHOS Project (1996-2001)

- As a follow-up of JSP2 conclusions the European Commission, in cooperation with the Belarus Chernobyl Committee, supported the ETHOS Project, a pilot project aiming to:
  - involve directly the local populations in the management of the radiological situation
  - with the perspective to improve their living conditions on a long term basis
- The Project was implemented by a multidisciplinary team of 12 French experts in radiological protection, agronomy, local development, sociology and psychology in villages of the Stolyn District in the South of Belarus, about 250 km East from Chernobyl
- I participated to 19 missions representing 150 days of work with the villagers and the local authorities and professionals
- The results of the Project were presented at an International Seminar held in Stolyn in November 2001
Map of soil contamination of Belarus
Cesium contamination of the Stolyn District
In the village of Olmany, Stolyn District, November 2001
The Stolyn Seminar
November 2001
The key lessons of the ETHOS project

• The direct involvement of the population in the day to day management of a contaminated territories is not only feasible but necessary to break the vicious circle of exclusion and loss of control

• This involvement must rely on the dissemination within all segments of the population of a “practical radiological protection culture” based on 3 pillars: radiation monitoring, health surveillance and education at school

• To be effective and sustainable, it must also rely on:
  – a responsible health care approach responding to the precautionary principle
  – the social and economic development of the territories
  – a local, national and international co-operation
The impact of the ETHOS Project

- The ETHOS Project was a turning point for the approach to the rehabilitation of long term consequences after a nuclear accident.
- It served as a basis for the development of the CORE Programme in Belarus which significantly influenced the post-accident policy of the country.
- Its lessons have been recognised by the international community (Cf the UNDP Strategy for Recovery report from 2002) and integrated into rehabilitation strategy preparedness in Europe (Cf. the SAGE and EURANOS projects supported by the European Commission).
- The ETHOS Project also largely contributed to the involvement of stakeholders in post-accident situations with the development of the co-expertise process and the practical radiological protection culture.
The CORE Programme (2004-2008)

- An Initiative of the Chernobyl Committee of Belarus following the conclusions of the ETHOS seminar (2001) and the UNDP report (2002) with the objective to:
  - Sustainably improve the living conditions in the areas contaminated by the Chernobyl accident in Belarus
  - Facilitate the development of local initiatives in 4 areas of action: health care, social and economic development, radiological quality, education and memory
  - Facilitate partnerships between actors at the local, national and international levels

- Participation of international organizations (UNDP, EC, UNICEF, OSCE), European embassies, expert bodies, NGOs,...

- Implemented in 4 districts of Belarus with a strong contribution of French organizations among which CEPN and IRSN

- Altogether I participated to 21 missions representing 175 days of presence in the contaminated areas, mainly in villages of the Bragin District to implement radiological monitoring at the service of the population
The CORE Programme in brief

- A original governance framework to identify, evaluate and follow-up projects proposed by local stakeholders
- Overall, 191 projects proposed and 146 approved and implemented between 2004 and 2008 in the 4 priority areas. I was the scientific coordinator of the one devoted to radiological quality
- A total budget of € 4.3 million euros contributed by Belarus organizations and 8 international partners
- The program demonstrated that it was possible to develop a practical radiological protection culture among local population, authorities and professionals through concrete local projects aiming at improving the living conditions of the population in the affected areas
A meeting of the ‘Approval Board’ of the CORE Programm - April 2005 in Bragin
The target districts of the CORE Programme

- Slavgorod
- Chechersk
- Bragin
- Stolyn
The radiation monitoring system implemented in the Bragin District (1)
The radiation monitoring system implemented in the Bragin District (2)

- Families
  - Self-help protection actions
- Hospitals
  - Vigilence
- Schools
  - Transmission
- Radiological quality control centres
  - Measurements of food products
  - Measurements of persons
- Local authorities
  - Collective protection actions
The approach for reducing the whole body contamination in the Bragin District

- Identification of the most contaminated children through whole body measurement campaigns in schools
- Dialogue with the concerned families to identify the main sources of contamination organized by a local NGO
- Measurements of the foodstuffs consumed in the families
- Identification of possible margins of manoeuvre to reduce the intake of contamination – actions of the local authorities if needed
- Follow up of the whole body contamination of the children by the following campaigns
The radiation monitoring system implemented in the Bragin District (3)
ICRP Publication 111

- The main lessons of the Belarusian experience have been taken up in Publication 111 of the International Commission on Radiological Protection entitled: ‘Application of the Commission's Recommendations to the Protection of People Living in Long-term Contaminated Areas after a Nuclear Accident or a Radiation Emergency’
- I had the honour of chairing the Task Group who prepared these recommendations
- It was a long process (almost a decade) mainly due to the misunderstanding of many Commission colleagues who do not had practical experience of rehabilitation in contaminated areas
- The Publication was finally released by the end of 2009. It has been used by Japanese authorities and experts to prepare decisions concerning the management of the Fukushima accident. It also helped some affected people to better understand the radiological issues of the accident
« After the nuclear accident, raging voices over Fukushima left behind those of us who live in Fukushima. Everybody wanted to have their say disregarding what we think and feel. I could not accept that. I even felt angry. The reason why I started ETHOS in FUKUSHIMA comes from the conviction that it is we who should narrate our life. In the midst of the turmoil ICRP111 was the only support for our mind ».

Ryoko Ando
Ethos in Fukushima
The Fukushima accident: 11 March 2011

- During 2 decades the management of post-nuclear accident situations was a strategic axis of the Programme of Work of CEPN with a strong commitment of the team in the affected areas of Belarus.
- In 2010 I personally thought that our contribution to the issue was over and I seriously considered to put an end to the works of the Research Group and no longer visit the contaminated territories.
- When I learned on the radio the explosion at the Fukushima Daiichi nuclear power plant, in an instant passed through my mind all what the people of Chernobyl had undergone for the past 25 years. Then my first thought was: 'Now people affected in Japan will face decades of worry and difficulties'.
- I was feeling down and suddenly very tired and I told myself that I will not invest in this new accident, that I had done my time and that it was up to the new generation to mobilize itself...
How I finally get involved in Fukushima?

- I had numerous exchanges with Prof. Ohtsura Niwa on my Chernobyl experience at the occasion of the ICRP Main Commission meeting in Seoul in April 2011 just a few weeks after the accident.

- Then I was invited by the Nippon Foundation to participate as official representative of ICRP to the International Expert Symposium on Radiation and Health Risks held in Fukushima City mid-September 2011. At this occasion I visited the Fukushima Daiichi Nuclear Power plant.

- Beginning of October 2011 I organized an ICRP mission in Belarus with Prof. Niwa and Prof. Kai who wanted to be directly aware of the situation in the affected areas. They met with national authorities, experts, local professionals, authorities and also the people of the Bragin district. On this occasion they realized the importance of directly involving the affected people in the rehabilitation process.

- At the end of the mission we decided to initiate a dialogue between all interested parties in the Fukushima Prefecture on the long term rehabilitation of the living conditions in the affected territories by the accident.
The visit of the Fukushima Daiichi NPP– September 2011
The ICRP mission in Belarus – October 2011
The first dialogue meeting
Fukushima City, November 2011
The dialogue meetings in Fukushima

• Following the success of first dialogue meeting it was decided to continue the experience

• Main organizers: ICRP, Radiation Safety Forum Japan, Ethos in Fukushima, Fukushima Medical University (FMU)

• Invited participants, observers and a team of ICRP facilitators

• Simultaneous Japanese / English translation

• Presence of the media (press, television and internet)

• Transmission of the Chernobyl experience through the invitation of Belarusian, Norwegian and French experts

• Financial / logistic supports of many Japanese and foreign organizations

• In total 16 dialogues meetings organized so far and further meetings are already planed. An International Workshop held in Date City in November 2015 to draw the lessons of the first 12 dialogue meetings
The lessons of the dialogue meetings

- The dialogue meetings confirmed that radiological protection must be at the service of the rehabilitation of living condition, that is to say the restoration of the dignity and well being of people.
- They did not raise new issues concerning the protection of people calling for a significant change of the recommendations of ICRP Publication 111.
- However, they brought several important clarifications and the challenge is now to incorporate them in the reflection currently under development to update Publication 111.
- This incorporation will be one of the contribution of the Fukushima residents to the transmission of their experience.
The ‘Kotaba’ Webdoc on the dialogue meetings

http://www.fukushima-dialogues.com
Ethos in Fukushima

• Following a presentation on 28 November 2011 at a public hearing organized by the Ministry of Environment of Japan in the presence of Minister Hosono, I was contacted by e-mail by a young engineer from Tokyo asking me for explanations on one of the points of my presentation.

• After several exchanges I learned he was translating my presentation for Mrs. Ryoko Ando, a young woman residing in the Iwaki region interested in knowing more about the experience of the Ethos project and ICRP Publication 111.

• A few weeks later I was surprised to hear the launch of the ‘Ethos in Fukushima’ web site: http://ethos-fukushima.blogspot.jp

• I invited Mrs Ando to participate to the 2nd Dialogue meeting held in Date City in February 2012 and she attended all meetings since then.

• In July 2012, Mrs Ando invited me to visit the Suetsugi community North from Iwaki City. Altogether I went 10 times to Suetsugi to meet the villagers and discuss the challenges of the community.
My experience with the Suetsugi community

July 2012

April 2016
The lessons from Suetsugi

- The Suetsugi experience confirmed the importance of the co-expertise process, that is to say experts evaluating the situation jointly with the residents taking into account local specificities.
- The experience also confirmed that the co-expertise process is very effective in developing a practical radiological protection culture among the affected people, gradually allowing them:
  - To Interpret the results of the measurements (ambient levels, external and internal doses, contamination of products)
  - To build their own benchmarks in relation to the radioactivity present in their daily life
  - To make their own decisions to protect themselves and their loved ones (self-protection)
My commitment with Nagasaki University (1)

• I was introduced to Prof. Yamashita by Prof. Niwa by the end of 2011 at Fukushima Medical University. We met regularly since then at the occasion of my visits to Fukushima

• Prof. Yamashita offered me to work at Nagasaki University in February 2015 during a diner in Fukushima city

• I came to Nagasaki for the first time in November 2015 to participate to the Second Technical Meetings on 'Science, Technology and Society (STS) Perspectives on Nuclear Science, Radiation and Human Health - the view from Asia’

• I gave my first series of courses to the students of the Master’s degree program of the Joint Disaster and Radiation Exposure Medical Science Graduate School of Nagasaki University - Fukushima Medical University in April 2016

• I became officially Professor of the University on January 2017 in charge of 3 courses: risk communication, radiological protection and advanced risk management
My commitment with Nagasaki University (2)
How I see my role in this long adventure

Jean-Baptiste Camille COROT (1796 – 1875)

Kuniyoshi UTAGAWA (1797- 1861)

The ferryman