

Comments on TG93

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Preface

I belonged to a research institute of a local government until 20 years ago and was in charge of surveying the national environmental radioactivity for about 15 years. Immediately after the accident at the TEPCO Fukushima Daiichi nuclear power plant, I participated in the Citizen Radioactivity Measurement Center (C-lab) that was established in Nagoya, and we are measuring the level of radioactive contamination to today. ICRP has historically discussed radiation protection for radiation workers. However, the greatest damage in a nuclear disaster is the general public. Therefore, here I would like to give my opinion mainly on the people affected by the TEPCO Fukushima Daiichi nuclear power plant accident.

P4-L36~38 About emergency exposure situation and existing exposure situation

P10-L259~268 (14)

P86-L3265-3270 (B-43)

The boundary between the emergency exposure situation and the existing exposure situation is not clear. It should be clearly stated that an existing exposure situation will become after it has been confirmed that the nuclear material has been fully controlled and no emergency exposure situation will occur. In figure 2.1 (Timeline of a large nuclear accident.) it was showed a clear line for emergency response and recovery process. However, there is actually no boundary, and it should be displayed with the gradation like as in the emergency exposure situation. It should be that the early, intermediate and long-term phase are classified according to the exposure dose at each category. Based on an understanding of the historical changes in ICRP dose limits for the general public, they are proposed as follows : the early phase is over 5 mSv per year and the intermediate phase is 5 mSv per year or less to 1 mSv per year or more and the long-term phase is 1 mSv per year or less. Also, the early, intermediate and long-term phase in Fukushima are listed in Table B.1 (Timing of the phases in Fukushima), but the Japanese government has not yet withdrawn from the emergency declaration. It should not be mentioned here at this stage. In fact, the position of the melted-down nuclear fuel has not yet been grasped.

P5-L86~92 (e) About actions to reduce radiation exposure cannot be straightforward

The three principles of radiation protection are time, shielding and distance. Even natural radiation is subject to protection. First of all, all people need to understand the three principles of radiation protection and pay attention to reducing daily exposure. In addition, at the time of an accident, by the individual self judgement of the residents, it should be considered and acted on three points as follows, 1) justification of actions, 2) optimization of radiation protection, 3) individual dose as low as possible (1 mSv per year or less). The government must also provide information and specific advice to residents for this purpose. The situation of

“Achievable” in the current concept of ALARA varies depending on the social position and is not uniform. When using ALARA principles, they should also be reflected at the individual level of the general public. On that basis, the government should support the public's choice to reduce public exposure.

P4-L48~56 About “The objective of optimization of protection is a progressive reduction in exposure to levels on the order of 1 mSv per year.

P6-L114~121(j) About “There is generally no need for the reference level to exceed 10 mSv per year.”

p55–L2112~2228 (226) About “Table 6.1 Reference levels for optimization of the protection of people in the case of nuclear accidents.”

Currently, the Japanese government is promoting a policy to return evacuated people to the land of 20 mSv per year in the Fukushima Daiichi Nuclear Power Plant accident in the state of emergency.

ICRP have already said in Pub.103 as follows. “For existing exposure situations, a reference level in the range of 1-20mSv or lower should be selected and 1 mSv per year is a representative value used to constrain the optimization process in long-term post-accident situations.” And current proposal says that “the reference level generally does not need to exceed 10 mSv per year”.

But what is the basis for this numerical value of 10 mSv? Based on the historical changes in the ICRP public exposure limit, it should be better the maximum value of a reference level is 5 mSv per year.

Of course, from the ICRP 1990 recommendation and 2007 recommendation, it is naturally necessary to reduce the exposure to 1 mSv or less per year as soon as possible. About the exposure situation, ICRP does not mention the exposure of children. It should be noted that the existing exposure situation for radiation-sensitive children, including pregnant women and fetuses, should be keep as low as 1 mSv per year.

By the way, current proposal is saying that the long-term goal is to reduce exposure to the order of 1 mSv per year. According to task group, it is that "order" means "approximately". But please do not use "order". Not a few peoples misunderstand it as a single digit order as same as 1-9.

It should be clearly stated that it should be no more than 1 mSv per year, based on the LNT model accepted by the ICRP. In the existing exposure situations, it should be recommended that residents can choose whether to dwell or not, and whichever choice is made, their lives should be guaranteed by the government and those responsible for accidents.

P6-L125~133(l) About practical radiological protection culture

The word “practical radiological protection culture” is already used in Pub.111. According to task group, it is that "culture" is the meaning of a habit. However, even if experience of radiation protection measures is accumulated by experiencing a nuclear catastrophe, there is a great sense of incongruity to recognize and inherit it as a custom or culture. Radiation protection measures should not be routine. The know-how of practical radiological protection should be maintained as a “disaster response” that should be referenced as needed.

P.11-L289~291 (16)

P.11-L293~302 (17) **About “Table 2.1. Dose thresholds for selected tissue/organ damage.”**

Table 2.1 shows only the deterministic effects of radiation, but it should be clearly mentioned that stochastic effects and in particular the ICRP recommends the LNT model.

P.17-L564~570 (53) About Stakeholder

In the Fukushima Daiichi Nuclear Power Plant accident, despite the importance of the presence of evacuees, neither the country nor the accident party recognizes responsibility for the accident. Therefore, the government is focusing only on people in line with national intentions. The government needs to talk with stakeholders who are different from the government policy. For example, regarding evacuee, there are people in various situations, including those who returned as public refugees, those who did not return, people who returned as voluntary refugees and those who did not return, etc. It should be that the government recognizes all those people in these various situations as stakeholders.

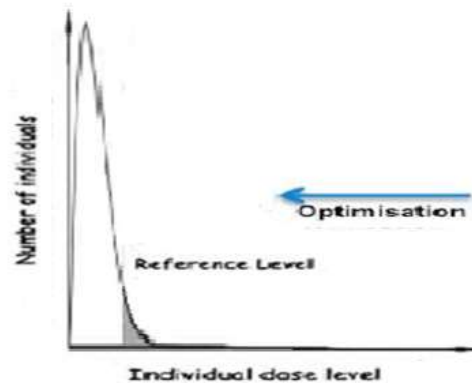
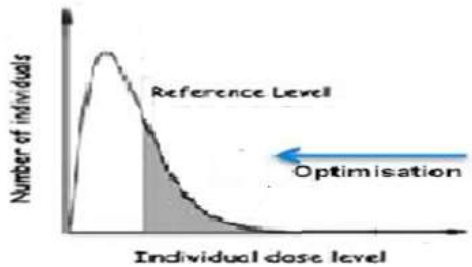
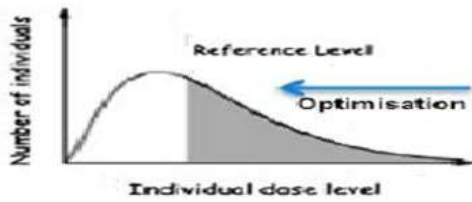
P22-L778~P23-L791 (76)

Fig.2.3 About using of a reference level and evolution of the distribution of individual exposures with time as a result of implementing the optimization process.

Fig.2.3 simply shows that the number of people exposed above the reference level decreases over time. As task group proposes to lower the reference level over time, fig.2.3 should be shown as bellow. It is shown that the peak area of the proposed figure is the same and the reference level value of the X axis decrease with time. Also, at any time, it is natural that people who exceed the reference level need to aim for further reduction of exposure with the aim of preferentially lower or 1 mSv per year.

Proposal figure is follows.

Fig. 2.3. Use of a reference level and evolution of the distribution of individual exposures with time as a result of implementing the optimization process.



P27-L955-968 (91) (92) About the importance of grasping the initial exposure

Even if the importance of grasping the initial exposure was known, the Fukushima accident proved that it was very difficult to respond with the actual accident. The multi occurrence of thyroid cancers in Fukushima children is not recognized as being caused by radioactivity. It is essential effectively to grasp the initial exposure in both personal monitoring and environmental monitoring, and the development of specific methods for this purpose should be promoted.

P48-L1836-L1852 (189) (190) About internal exposure

The effectiveness of whole-body counter measurements is described to observe internal exposure during the intermediate phase. This is mainly for observing radioactive cesium in the whole-body. Similarly, Sr-90 taken from the diet accumulates primarily in the bone, so internal exposure continues for a long time. Children's milk teeth can be collected non-invasively. Therefore, it is necessary to mention the measurement of Sr-90 in children's deciduous teeth.

P73-L2820~2825 (A48)

Table A.2 About timing of the phases in the Chernobyl accident.

Table A.2 only states “adoption of laws on the legal status of contaminated areas in Belarus (February), Ukraine (February), and the Russian Federation (May)”. The Chernobyl method is divided into the forced restricted areas and four category regions according to the soil contamination concentration and the air dose rate based on it. In areas of 1-5 mSv per year, the selection of evacuating or not evacuating is allowed, and government support can be obtained with either selection. This law is good case study that should be handed down to future generations, and detailed description is desired.

- 30km zone : Zone where is forcibly non-resident (no entry zone).
- Forced emigration: Zone where it is obliged to emigrate.
- Emigration: Zone where emigration is compulsory, but residence rights are allowed if desired.
- Selective migration: Zone where migration rights occur.
- Radioactivity monitoring: Zone where can receive social benefits such as radiation monitoring and medical examinations.

P85-L3244~P86-L3263 B.4.7. About Health surveillance

In the Fukushima Health Survey (FHS), thyroid cancer is frequently occurring in children under 18 years old at the time of the accident. According to the National Cancer Center, children between 0-19 years old have a thyroid cancer prevalence of 0.1-0.3 people per 100,000 people. The average of Japanese people is about 8 people in 2010. On the other hand, according to FHS, about 15 to 45 children have undergone surgery per 100,000 people under the age of 18 at the time of the Fukushima Daiichi nuclear accident.

The Fukushima Health Survey Review Committee (FHSRC) says that it is not the effect of radiation because it is different from the appearance situation of thyroid cancer in Chernobyl (which the children under 5 had get thyroid cancer). Furthermore, the HFSRC says that radiation exposure is lower than that of Chernobyl children and there is no correlation between exposure dose and cancer occurrence. As for the exposure dose, radioactive iodine concentration at the time of the accident was hardly measured. Therefore, it was not to be able accurately to grasp the exposure dose due to radioactive iodine. In future, it will be necessary to monitor the health conditions of children in Fukushima over the long term.

The survey by a private organization (3.11 Children's Fund for Thyroid Cancer) has revealed that some children have get thyroid cancer that is not counted in FMHS. It should be clearly made a clear recommendation that the correct and comprehensive recording of the Fukushima children's health survey results in protecting the children's health and protecting the future of humanity.

P86-L3265~3270 (B43) About table B.1 Timing of the phases in Fukushima.

The contents of the table have already stated that it is premature. Japan remains a declaration of emergency at presence. Therefore, it is better to simply record the status of the accident reactor in chronological order rather than prescribing in the initial, middle and long term.

In Chernobyl, the government had forced to evacuate the people living within 30 km. After that, for those

outside the 30 km area, they were classified into forced migration, migration, selective migration, and radioactivity monitoring area according to the Chernobyl Act five years later (1991).

In Japan, despite the fact that there was no clear boundary in the radioactive contamination situation, the government issued evacuation instructions mainly at the local government level in Fukushima Prefecture. Therefore, the people outside the public evacuation area had to evacuate on themselves. The Japanese government has been promoting a evacuee return policy to areas 20mSv or less per year 6 years later (2017). Whether directed evacuation or voluntary evacuation, and continuous evacuation or return, the support of the government was quite insufficient. In fact, the government's discontinuation of housing assistance to unilateral evacuees was a ruthless and unreasonable policy. Approximately 30 cases of evacuee lawsuits are pending nationwide. No matter what the situation is, individual judgment should be respected both the case of evacuation continuing or the return, and it should be given necessary and sufficient administrative supports for life there. It should be need strongly to recommend that it is necessary to keep a living environment of 1 mSv or less per year for children and pregnant.

Finally,

I hope ICRP suggestions on how the world should prepare for the next nuclear accident, and more than that, on what the world should do so that the people around the world will not be exposed by radioactivity more than this.

Appendix

About “Minna-no Data Site” publisher : "Illustrated map with radiation measurement at 17 prefectures + commentary”

After the Fukushima Daiichi Nuclear Power Plant accident, approximately 100 citizen radioactivity measurement stations were established nationwide as non-governmental organization. Among them, more than 30 citizens' radioactivity measuring stations whose measurement accuracy was confirmed participated, and in 2013, the “Minna-no Data Site (MDS)” was established. MDS operates a website that lists the measurement results of each measurement center in the same format and makes it easy to search for radioactivity concentrations by food, region, year, etc. From 2014 to 2017, MDS collected 3400 soils in 17 prefectures in eastern Japan with the cooperation of 4,000 ordinary citizens and measured the concentration of radioactive cesium. The measurement results not only were published on the website, but also as an atlas titled “Maps with Radiation Measurements and Explanations in 17 Prefectures” in the fall of 2018 after the Minna-no Data Site publisher was established. And also, the English digest version have been published recently as the booklet titled “Citizens’ Radiation Data Map of Japan”.

I hope the ICRP members will too read that booklet.

