

**NERIS comments on ICRP report:*****Radiological Protection of People and the Environment in the Event  
of Large Nuclear Accident******September, 5, 2019*****NERIS contributors:**

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**1. GENERAL COMMENTS**

First of all, the participants acknowledge the significant improvements of this version of the report compared to the draft sent for pre-consultation in February 2019. In general, the document is clear, easy to read and not too technical. There is a good explanation concerning the way radiological protection issues are addressed in a global perspective. The explanations on the selection of the 10 mSv reference level are significantly improved as well as the difference between responders on-site and off-site. The update of the terminology is also quite useful. The link with the consequences of the Fukushima accident, notably the reference to ICRP TG84, is better summarised.

***Optimisation process***

In the presentation of optimisation process, the various factors to be considered are well described, however in the implementation this is not always clear how to take into account all these factors. In addition, there is a focus on the selection of “best option” which is not well defined and gives the idea that there is “one option above all others” while in practice there is a need for value judgement to take account of all the factors. This “best option” is probably not achievable in practice and it would be better to refer to “robust option” than “best option”. In this perspective, it is suggested to better reflect the flexibility that should be introduced in the optimisation process in order to cope with the complexity of the situation.

The figure 2.3 describing the optimisation process is too focussed on the recovery process and limited to the comparison with the reference level. Notably, it gives the wrong impression that the objective of optimisation is to reach the reference level, although in emergency response the main focus should be to optimise bellow the reference level.

***Co-expertise process***

The introduction of co-expertise process in the recovery process is a significant improvement. However, there is no reason to limit the co-expertise to recovery. It would be meaningful to introduce it for emergency response,

notably for the intermediate phase but also in preparedness. For the early phase, it should be useful to mention that work can be done in preparedness, including co-expertise. For this phase, it is currently mentioned that there is no time to perform analysis, while in practice it would be more meaningful to reinforce the role of preparedness to support emergency response and recovery process.

#### *Protection of the environment*

It should be useful to further expand the discussion on the protection of the environment, notably in reference to the approach promoted in ICRP Publication 124. The list of available countermeasures dedicated to the protection of the environment could be mentioned.

#### *Aquatic pathway*

Considerations on the aquatic pathway are limited and this pathway is generally considered as not significant for exposure. Contamination of drinking water reservoirs, irrigation or areas of fish production might be an issue far away from the release where there was no contamination from atmospheric transport and deposition. For these populations, it is the main contribution to the dose. It would be useful to revise this statement and to take into account the possible consequences on populations far away from the damaged installation which may be impacted essentially through the aquatic pathway. In addition, countermeasures associated with the management of the aquatic pathway should be mentioned.

#### *Urban countermeasures*

The description of countermeasures is largely developed for agriculture while there are limited considerations on the urban areas. It would be useful to introduce a dedicated section on this issue with references to the different handbooks developed to cope with urban areas.

#### *Uncertainty*

There is no clear reference to the issue of uncertainties, neither in the assessment of the consequences, nor in the decision-making processes. In this context, the process described is rather “deterministic” while in practice it is essential to better address uncertainty. The reference to the research projects under development in Europe on this issue could be useful.

#### *Stakeholder participation*

The interaction with local stakeholders is emphasized several times in the document. This can be strengthened by also adding cooperation with national and international scientific communities. In the aftermath of Fukushima, the involvement of ICRP and also universities outside Japan has strengthened the trustworthiness of some countermeasures.

#### *International guidelines*

There is no clear mention of OIL or other international guidelines. Although this is not the role of ICRP, it should be useful to mention the role of international organizations that deal with this issue.

#### *Preparedness*

Even though a paragraph has been added to the chapter on preparedness, it would deserve to expand this chapter especially with additional references to the work achieved by different national and international organizations. In addition to the introduction of co-expertise process to develop preparedness, it should be useful to introduce the need for developing awareness for emergency and recovery for the whole population. It is acknowledged that practical preparedness is not achievable for the whole population, but awareness should be easier to implement.

## **2. SPECIFIC COMMENTS**

**Main points:** Precise that the band 1-20 mSv is mSv per year.

§(a) The statement on “alarming image” is probably true but it gives a strange impression that the other factors are not so important. Rewording of this sentence is advisable.

§(m) Preparation of strategies and plans should be performed to train the relevant responders and inform the population in advance as there the pre-conditions are much better – e.g. co-expertise – and not only because time is too short. This sentence might be revised.

§(15) – line 280: ‘factors related to psychology, health, environment, education, culture...’ Within the list of factors, do not begin by psychology. Maybe change the order of the factors or change ‘psychology’ factor into ‘social’ or ‘societal’ factor.

§(15) In this section there is no mention to sensitive populations such as children and pregnant women.

§(25) – Change the first sentence to introduce the fact that for a specific situation, protection of the environment may not be achieved only with protecting people, as it is referred to in paragraph 65.

§(31) – line 395/396: ‘For example, the agricultural sector is significantly disturbed due to contamination of soil and livestock, affecting food production as well as its...’ In addition to contamination of soil and livestock, the food production is also disturbed by the loss of image of the foodstuffs produced within the affected territories, whether foodstuffs are contaminated or not. Within paragraph 31, it would be useful to add the issue of loss of image as for instance: ‘For example, the agricultural sector is significantly disturbed due to contamination of soil and livestock and the impact of the loss of image of all products from the affected territories.’

§(39) Under section 2.2.6 “Health impacts of changes in life style” the DRD (disaster related death) is not explicitly mentioned. At least the DRD is an official number and might be mentioned in the text besides the other papers.

§(45) International cooperation on scientific expertise could be reinforced.

§(77) Paragraph 77 should focus on emergency responders that may exceed 100 mSv.

§(80): Precise that the band 1-20 mSv is mSv per year.

§(82) Include reference to ICRP publication 124 on DCRL and possibly introduce a figure and/or table to explain them.

§(92) No need to restrict to caesium.

§(96) The exposure due to liquid releases to the aquatic environment should be added

§(99) The calculation of internal exposure with air monitoring is restrictive. Need to be harmonized with paragraph 102.

§(100) Better clarification of the last sentence on data collection and the role of authorities.

§(101) Details on biological monitoring not needed.

§(102) Avoid the details on monitoring during the first weeks. Not useful.

§(103) Precise the origin of the food, especially those food products that are home-grown and escape the controlled ones that are available on the market.

§(104) Check the adequacy of the recommendations from ICRP with the privacy of individual information on internal and external exposures.

§(130) For the increase of risk of thyroid cancer, add references and check the risk for high level of exposure (not only cancer risk).

§(131) lines 1356 and 1357, change “potassium iodine” to potassium iodide, the correct chemical name.

§(172) – line 1694-1700: As it is mentioned, protective actions should be discussed and evaluated together with the government, the responsible authority and the stakeholders. As these protective actions will be adapted to the local needs, they can vary from one community to another. Maybe there is a need to insist on this last point and to clearly mention that the idea is not to apply identical protection actions to all affected communities.

§(173) – Separation of dose levels for responders and population in the recovery phase might be misleading and need justification.

§(210) – line 1983-1991 Possible additional elements: Implementing local projects also give the chance to local communities to take the ownership of their situation and its future. It is also a way to implement long-term vigilance within the affected territories.

*§(217) – line 2036-2038* Feedback experience from post-Chernobyl situation and more particularly, the recent implementation of European research projects (TERRITORIES) in affected territories (Belarus) shows that more than 30 years after the accident, local people still have strong concerns about the radiological situation of their environment. Local people also do not really understand the progressive disengagement of international expert communities over time because of the lack of financial support. In this last paragraph, it could be worthy to mention that, within affected territories, there is a need for long-term vigilance (lasting for decades) and that the involvement of national and international experts over time is needed.

#### *APPENDIX Fukushima*

It would be useful to add the decisions made after 2015 in the timeline.

*B5* on iodine prophylaxis – not sure if the block is OK? Citation from draft report – better than final report

*B29*, IAEA is not the primary source. The necessary conditions to lift the evacuation order is described in “Policy and issues for further discussions about rearrangement of warning area and evacuation area after the completion of step 2” which was issued by Nuclear Emergency Response Headquarters in Dec. 2011). The description is summarized in “Toward acceleration of Fukushima reconstruction from nuclear disaster, revised” as follows (Prime Minister’s Office of Japan website, [https://www.kantei.go.jp/saigai/pdf/hinan\\_youken.pdf](https://www.kantei.go.jp/saigai/pdf/hinan_youken.pdf))

*Fig. B3*. Better explain this figure and refer to it in the text.