

## Implementing optimisation in post-accident situation : some lessons from Fukushima

Shogo TAKAHARA <sup>A</sup>, Pascal CROÛAIL <sup>B</sup>, Thierry SCHNEIDER <sup>B</sup>

<sup>A</sup> Japan Atomic Energy Agency  
2-4 Shirakata, Tokai-mura, Naka-gun, Ibaraki, Japan  
takahara.shogo@jaea.go.jp

<sup>B</sup> Nuclear Evaluation Protection Center  
28 rue de la Redoute 92260 Fontenay-aux-Roses, France

Reference dose levels in emergency and existing exposure situations are important indices to practically implement the optimisation principle. Those are recommended to be selected from effective dose bands of 20–100 mSv (acute or per year) and 1–20 mSv (per year) for emergency and existing exposure situations, respectively. The reference level is applied to decision making for protection of the public, above which it is judged that planning to allow the exposures to occur is inappropriate, and below which optimisation of protection should be implemented. The reference level is chosen, depending upon the prevailing circumstances of the exposures under consideration. In post accident situation, as exposure conditions and radioactivity distributions change momentarily, it may be appropriate to update the reference level in a timely manner. However, before the Fukushima Daiichi Nuclear Power Plant accident, insights had been insufficient for implementing the update and the choice of reference level in post accident situation.

The Fukushima accident is the first experience for considering these issues. While most people affected by the Fukushima accident were appropriately protected against radiation exposure, some confusion emerged during the practical use of the reference level and other numerical criteria. For example, an annual effective dose level of 20 mSv was used for benchmarks related not only to the evacuation of people from the contaminated areas but also to the resumption of schools. Therefore, the Japanese public strongly protested that 20 mSv/y was too high because the benchmark for ensuring the safety of children was the same as that for evacuation.

In this study, the authors reviewed the data on evolution of the reference level and other numerical criteria which were used for making decisions on protective actions after the Fukushima accident, and also analyzed the data to get insights on confusions which were caused by the use of the reference level and other numerical criteria. In addition, based on these insights, we made considerations about how to choose the reference level, and how to update appropriately in a timely manner.