Integrated Protection of People and the Environment: A View from Japan

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Abstract–Six and half years after the Fukushima Daiichi nuclear power plant accident, we still have an area of the existing exposure situation. One of the greatest concerns of people is the more elevated level of ionizing radiation than before, though there is no expected discernible health effect. After the accident, several "abnormalities" in environmental organisms were reported. It is still not clear whether many of these abnormalities were radiation-induced. It appears that the impact of the released radioactivity has not been sufficient to threaten the maintenance of biological diversity, the conservation of species, or the health and status of natural habitats, which are the focus in environmental protection. This highlights a difference between the protection of people and that of the environment; individuals for people and population for the environment. The system for environmental protection has been developed with an approach similar to that of the system developed for people. Reference Animals and Plants (RAPs) were introduced to connect exposure and doses in a way similar to that for "reference males and females". RAPs can also be used as a tool to associate the level of radiation (dose rate) with the biological effects on an organism. Here we identified another difference between the protection of people and that of the environment: an effect on people is measured in terms of dose and that on the environment is measured in terms of dose rate, i.e. protection criteria for people are expressed in term of doses (as dose limits, dose constraints, and reference levels), whereas those for the environment are expressed in terms of dose rates (as in the Derived Consideration Reference Levels). The Fukushima Daiichi nuclear power plant accident has created several challenges with respect to radiological protection systems. One challenge is regarding to the environmental protection. Considering the abovementioned differences will lead to an integrated system for the radiological protection of both people and the environment.