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Title

Considerations about the protection of emergency and recovery responders in affected areas

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Text

Diverse people may be involved in the response to a nuclear emergency and the following recovery: emergency teams (firemen, policemen, medical personnel…), workers (from the damaged facility or involved because of their skills), and other people (elected representatives, members of NGOs, citizens…). Some of the responders are previously prepared to intervene under radiation, others not. When the event arises, it is a breaking and the responders should be adequately protected according to specific rules although inspired by those for radiation workers. A graded approach is needed, allowing for a response adapted to the prevailing circumstances. The graded approach should make a distinction between on-site (the damaged facility) versus off-site (the affected areas) and between the different accident phases: early, intermediate and recovery/long-term phases. The tasks likely to

provide higher doses should be completed by responders already prepared and trained. The present paper is based on the Fukushima experience and focused on responders off-site, i.e. in affected areas.

The protection of the emergency and recovery responders is based on the justification and optimisation principles. The justification of decisions should balance the benefit, i.e. avoiding or reducing public and environmental exposures, with the disadvantages including the risk for responders. Because of the circumstances (unforeseen event, lack of experience, large uncertainties), the optimisation process should be implemented in a specific way in the early and intermediate phases. The application of the dose limits is a priori not relevant and should be replaced by the application of reference levels.

In the early and intermediate phases, outside the damaged facility, early countermeasures are implemented at the beginning, followed by actions aiming at the characterisation of the situation. Classical emergency teams (firemen, policemen, medical personnel), workers with specific skills such as bus drivers or people involved in the monitoring of the affected areas, as well as voluntary citizens may be involved. They are directly or indirectly under the responsibility of the response organisation. Their doses may be high, although less than on-site. The reference level may start at 100 mSv or lower and decrease to 20 mSv or lower in the intermediate phase, keeping in mind that the responders will intervene close to the population. The objective is to try to maintain doses below 100 mSv during the response.

In the recovery/long-term phase, the experience from Fukushima shows that many categories of people may be involved in the response (skilled workers, citizens…) in the affected areas. It also appeared that a significant discrepancy in the protection of the responders versus the population (e.g. in terms of individual protective equipment) is not welcome while they are at the same place at the same time. Consequently, when the operation is implemented in a restricted area (not open to the public), the exposure of recovery responders should be considered as occupational exposure and managed using the corresponding requirements with a reference level of 20 mSv per year or lower. However, when the operation is implemented among the population by a mixed group of workers and volunteers, a similar protection should be provided, using a reference level of 10 mSv per year or lower.

This paper reflect the work of the Task Group 93 of International Commission on Radiological Protection (ICRP), in charge of updating Publications 109 and 111 but does not necessarily reflect the views of the ICRP.