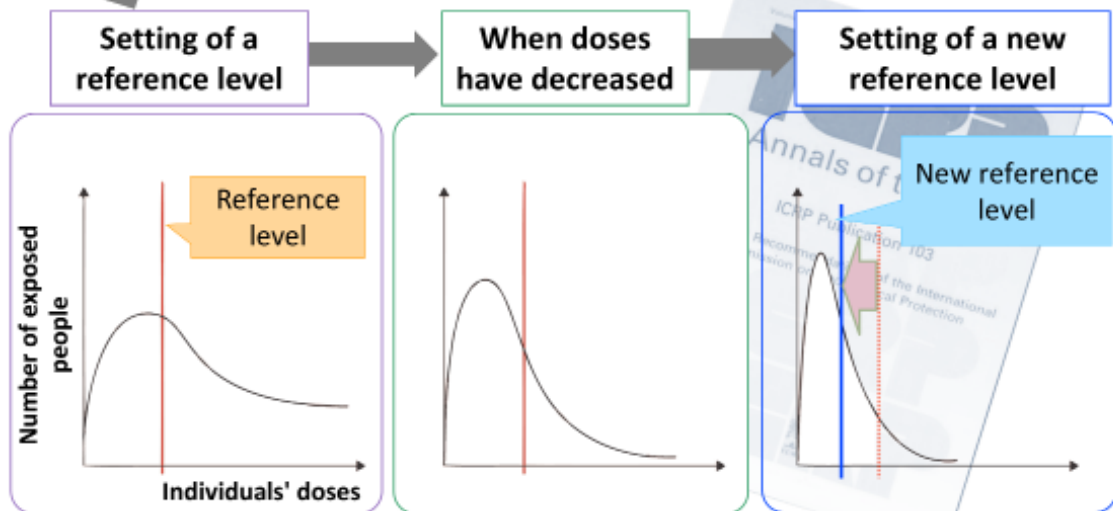


Flow of optimization using reference levels

Initial situation



Source: Prepared based on the ICRP Publication 103, "The 2007 Recommendations of the International Commission on Radiological Protection" (ICRP, 2007)

The concept of reference levels as suggested in the 2007 Recommendations of the ICRP has been adopted in promoting measures to reasonably reduce exposure doses due to nuclear power plant accidents, etc. (optimization of radiological protection). In an emergency such as an accident or nuclear terrorism (emergency exposure situations), the focus is placed on measures to prevent serious physical disorders. Therefore, dose limits (limits for exposure to all regulated radiation sources under planned exposure situations) are not applied. Instead, a reference level is set within the range of annual doses of 20 to 100 mSv for the public and protection activities are carried out so as to limit individuals' doses below that level. Physical disorders that would never be seen in normal times may develop in an emergency. Accordingly, measures to prevent such physical disorders are prioritized over measures to be taken in normal times (to reduce risks of developing cancer in the future). Thereafter, in the recovery and reconstruction period (existing exposure situations), a reference level is set within the range of annual doses of 1 to 20 mSv for the public, and efforts for the optimization of radiological protection are commenced.

Reference levels aim to ensure that no one receives an unduly high dose in a circumstance where exposure doses among individuals are not even. When considering protection measures for the entirety, if there are people who are likely to receive doses exceeding the predetermined reference level, countermeasures for those people are preferentially taken. If dose disparity within a group diminishes as a result of such intensive countermeasures, and there is almost no one who receives a high dose exceeding the reference level, a new lower reference level is set as necessary to further reduce exposure doses as a whole. In this manner, exposure dose reduction can be achieved efficiently from the perspective of optimizing radiological protection by setting appropriate reference levels depending on the circumstances.

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