









Council Directive [2013/59/EURATOM](#) sets basic safety standards for the public and professionals

The European Directive sets radioactive dose limits for the public and professionals. The limits are set in millisieverts, a unit that, in a way, measures the health impact of radiation on the human body. The dose is usually calculated over a year. The legal indicative limits are as follows:

-  1 mSv, general limit for the public
-  6 mSv, professionals aged 16 to 18 exposed in the workplace
-  20 mSv, adult professionals exposed in the workplace
-  50 mSv, adult professionals, if the average over 5 years does not exceed 20 mSv
-  100 mSv, evacuation of the public in case of a major accident
-  500 mSv, limit for emergency workers in life-saving situations

The below table shows the structure of the limits on the effective dose related to ionising radiation that shall be respected and adapted to different circumstances. If the limit protecting the public is set at 1 mSv for any single year, it is established between 20 and 100 mSv in an emergency situation due to a severe nuclear accident (Art. 53.2(a)).

Limit (mSv)	Yearly public exposure and yearly professional exposure	Professional exposure in special circumstances	Emergency exposure for workers and the public	Emergency occupational exposure for emergency workers
≤ 500				In order to save life in exceptional situations, the reference level for emergency workers shall not exceed 500 mSv (Art. 53.2(b))
≤ 100			Reference levels for emergency occupational exposure shall be set, in general below an effective dose of 100 mSv (Art 53.2(a)) 20 to 100 mSv is the limit to evacuate the public (Annex I §1)	
≤ 50		The limit shall be 50 mSv for professionals in special circumstances if the average annual dose over any five consecutive years, including the years for which the limit has been exceeded, does not exceed 20 mSv (Art. 9.2)		
≤ 20	The limit shall be 20 mSv in any single year for adults in professional exposure (Art. 9.2)		Emergency occupational exposures shall remain, whenever possible, below 20 mSv (Art 53.1 → Art. 9.2)	
≤ 6	The limit shall be 6 mSv for Students or apprentices aged ≥ 16 and ≤ 18 years in the course of their studies if obliged to work with radiation sources (Art 11.2)			
≤ 1	The limit shall be 1 mSv for any single year (Art. 12)			

Annex 1 of the Council Directive 2013/59/EURATOM states that, “1. for existing exposure situations, reference levels expressed in effective doses shall be set in the range of 1 to 20 mSv per year for existing exposure situations and 20 to 100 mSv (acute or annual) for emergency exposure situations. 2. (...) 3. For the transition from an emergency exposure situation to an existing exposure situation, appropriate reference levels shall be set, in particular upon the termination of long-term countermeasures such as relocation. 4. The reference levels set shall take account of the features of prevailing situations as well as societal criteria, which may include the following: (a) (...); (b) in the range up to or equal to 20 mSv per year, specific information to enable individuals to manage their own exposure, if possible; (c) in the range up to or equal to 100 mSv per year, assessment of individual doses and specific information on radiation risks and on available actions to reduce exposures.”

Evacuation of the public is specified in Annex XII B §1(b)(i).

The range of the reference level for evacuation of the public is set up from 20 mSv to 100 mSv in Annex I §1 (through Art. 7.2). In deciding whether or not to evacuate the population, civil protection should be able to consider the capacity of the dwellings not to let in a dose higher than 100 mSv.

As stated in Annex 1 of the Council Directive, relocation after an emergency exposure can be set from a yearly exposure of 20 mSv, or till 100 mSv with a specific accompaniment.

Despite the need for adaptation to circumstances and despite the fact that limits set between 1 and 6 mSv have no legal significance in case of a major nuclear accident, all the limits specified by Council Directive 2013/59/EURATOM show that doses above 1 mSv should not impact the public and that, more generally, thresholds in the two left columns are also of symbolic, scientific and moral significance: they are the gate keeper to protecting individual and public goods: > 6 mSv breaches students and apprentices interests (and the public good); > 20 mSv breaches professional's interest (and the public good. All in all, legal provisions on emergency situations are somewhat completed by the provisions on yearly public exposure.

Almost all reference thresholds of the present study come directly from the Directive on ionizing radiation, so that the public, decision maker and the media can understand the results of the simulation from the legal and moral perspectives besides the scientific one¹.

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¹ This is interdisciplinarity in an interconnected world.