World Nuclear Association Position Statement on Decision-Making at Very Low Doses

The following is a position statement by World Nuclear Association relating to the regulation of very low dose radiation exposure. The Association represents around 275 member companies across the nuclear value chain around the world, and this statement has been developed in consultation with radiation protection practitioners and key international organizations. It is supported by the Association's technical report, Decision-Making at Very Low Doses, prepared by its Radiological Protection Working Group.

For the purposes of this statement, 'very low dose' is defined as doses that make at most a marginal difference to the total dose to any individual, and doses which are so small that they are subsumed in the noise/variability of exposure to natural background radiation. On this basis, very low dose covers the range of a few tens of μSv/yr, up to a maximum of a few mSv/yr.

The current situation

- The current approach in the system of radiological protection supports and encourages unjustified allocation of society's resources on negligible radiological impacts. These resources can take the form of public funds, regulatory effort, and industry resources for example, with downstream effects in areas such as energy prices, job creation, and sustainability factors such as the ability (or lack thereof) to reasonably recycle materials. This is detrimental to society as a whole
- Very low doses are treated differently, depending on their source. Natural background radiation ('existing exposure') is essentially accepted up to around a few mSv/yr, and everyday choices about diet, travel or where to live that change it are not regarded as worthy of control. Yet human-made planned exposures ('practices') are subject to regulatory control however small the dose. This dichotomy is inequitable, confuses the public and reinforces the false perception that human-made radiation is more dangerous than natural radiation.
- There is no clear scientific evidence of risk at very low doses. Clear epidemiological evidence of health risk exists only above about 100 mSv. Below that level the evidence is limited and inconsistent, and at sub-mSv doses there is no clear evidence of risk at all. Any residual risk would be extremely small compared with the risks of everyday life, and lies well within the variation of natural background radiation, which averages about 3 mSv/yr worldwide and ranges up to many tens of mSv/yr.
- The linear no-threshold (LNT) approach assumes that risk rises in proportion to dose all the way down to zero. It was adopted as a practical basis for radiological protection and is not claimed to be a proven scientific theory. World Nuclear Association accepts LNT as the best current basis for the system, but at very low doses it is not a reliable indicator of risk or harm and should be applied with the graded approach, not be the sole basis for decisions.
- Over-conservatism leads to disproportionate and sometimes harmful outcomes. The International Commission on Radiological Protection's (ICRP) own guidance that societal resources should not be wasted is often ignored in practice. For example, clearance criteria can be so restrictive that actual doses are one to two orders of magnitude below the already conservative 'trivial' level of some tens of μSv/yr, forcing material that could be recycled to be managed as radioactive waste at considerable cost. Disproportionate controls also fuel public fear of radiation and can even increase overall harm by exposing people or the environment to greater conventional risks.

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Recommendations

Controls must be proportionate to the risk. World Nuclear Association therefore calls on the ICRP, international organizations, governments and regulators to act on the following:

1. Simpler, graded, risk-informed approach that places greater emphasis on good governance and proportionality. The ICRP has already recognised that limited societal resources must not be wasted:

    - *"Governments have obligations not to allow societal resources to be squandered on unproductive legislation and fruitless regulatory control, and not to limit individual freedoms. The stringency of regulatory requirements placed on an activity should be commensurate with the scale of risk arising from the activity." [Scope of Radiological Protection Control Measures, ICRP Publication 104 (2007)]*

    - *"It should be stressed that optimisation is not minimisation. It is the result of an evaluation that carefully balances the detriment from the exposure (economic, human, social, political, etc.) and the resources available for the protection of individuals." [Assessing Dose of the Representative Person for the Purpose of the Radiation Protection of the Public, ICRP Publication 101a (2006)]*

2. Give proportionality greater prominence. The ICRP and other international organizations should give these statements a much higher profile in the next ICRP General Recommendations and in their major publications, and actively advocate the proportionate application of the system of radiological protection at very low doses.

3. Pursue optimization, not minimization. Decision-making at every level should aim for optimization, not the minimization of dose. Assessment and decision-making processes at very low doses should be realistic rather than built on multiple conservative assumptions or worst-case scenarios, and should account for all relevant risks, not radiation alone.

4. Acknowledge uncertainty in decision-making. Decisions at very low doses should explicitly recognize the uncertainty in risk estimates at these levels, and the LNT approach should not be the only input.

5. Set a practical cut-off below which no further regulatory effort is needed. This level should be in the region below which exposures are considered to pose no significant harm worthy of further resource allocation or regulatory interest, and below which any further intervention would require special justification.

World Nuclear Association and its member organizations are fully committed to high standards of radiological protection. That commitment is exactly why the Association calls for decision-making at very low doses to be proportionate to the risk, so that society's resources are used appropriately to deliver genuine protection.

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