

Reference Values for Emergency Responder Radiation Safety

Terminology	Accumulated Dose	Recommended Application or Action	Document
Response worker guidelines	5 rem (50 mSv) 10 rem (100 mSv) ≥25 rem (≥250 mSv)	All occupational exposures Protect critical infrastructure Lifesaving or protection of large populations	PAG Manual: Protective Action Guides and Planning Guidance for Radiological Incidents (EPA, 2017)
Decision dose	50 rad (0.5 Gy)	Decide whether to remove responder or continue mission, based on operational awareness and mission priorities	NCRP Report No. 165, Responding to a Radiological or Nuclear Terrorism Incident: A Guide for Decision Makers (NCRP, 2010)
Turn-back dose guidance	50 rem (500 mSv) 100 rem (1 Sv)	Prevent severe health effects or injuries Lifesaving actions	Manual for First Responders to a Radiological Emergency (IAEA, 2006)
Cold zone ("outer perimeter")	≤0.01 R h ⁻¹ (~0.1 mGy h ⁻¹)	Alarm threshold	Key Elements of Preparing Emergency Responders for Nuclear or Radiological Terrorism (NCRP, 2005)
Hot zone	>0.01 R h ⁻¹ (~0.1 mGy)	Routine response activities performed with personal protective equipment, including active radiation monitoring	Key Elements of Preparing Emergency Responders for Nuclear or Radiological Terrorism (NCRP, 2005)
Dangerous-radiation zone	≥10 R h ⁻¹ (~0.1 Gy h ⁻¹)	Restrict actions to time sensitive, mission critical such as lifesaving	NCRP Report No. 165, Responding to a Radiological or Nuclear Terrorism Incident: A

			Guide for Decision Makers (NCRP, 2010)
Turn back	200 R h ⁻¹ (~2 Gy h ⁻¹)	Responders should turn back, even when working on life saving missions	Handbook for Responding to a Radiological Dispersal Device: First Responders Guide — The First 12 Hours (CRCPD, 2006)

Note: Local agencies may have alternate guideline values for responder operations.

Source: [Guidance for Emergency Response Dosimetry](#) (NCRP Report 179), National Council on Radiation Protection and Measurements, Bethesda, MD, 2017, Table 4.1.