



SAND2010-0477C



DU Hazards and Protective Measures for the Public and the Environment

Sandia is a multiprogram laboratory operated by Sandia Corporation, a Lockheed Martin Company,
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Topics

- **Goals and Challenges**
- **Properties and Hazards of DU**
- **Modes of Exposure**
- **Protective Measures**



Goals & Challenges

Major Goals – Awareness to:

- Protect the public; and
- Protect the environment

Unique Challenges:

- Concentration levels in soil exceed background levels in some areas (civilian & military)
- Public awareness is generally low
- Exaggerated fear of radiation linked to DU increases anxiety of the public
- On-going studies of health effects



Goals & Challenges

Unique Challenges (Cont.):

- Expect *immense* interference from media
- Uninformed people, acting as experts, may give wrong and misleading information
- When justified, clean-up of affected areas
- Storage, control, and monitoring of collected DU residue



Properties & Hazards

What is Depleted Uranium (DU)?

- What remains from enrichment process (chemically same)
- Heavy metal (like lead, tungsten)
- 40% less radioactive than natural uranium
- Natural uranium is all around us - in the air, soil, in the food we eat, and the water we drink
- Uses (munitions, counterweights, armor plate)
- Chemically toxic



Properties & Hazards

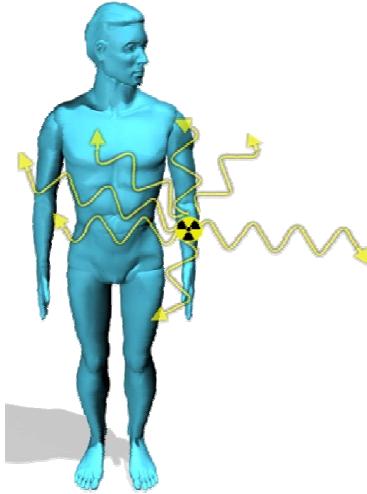
What is Depleted Uranium (DU)? (cont.)

- Pyrophoric in munitions and finely divided particles
- “Spent” DU found in affected areas will usually have a dull black color and possible yellow flaking

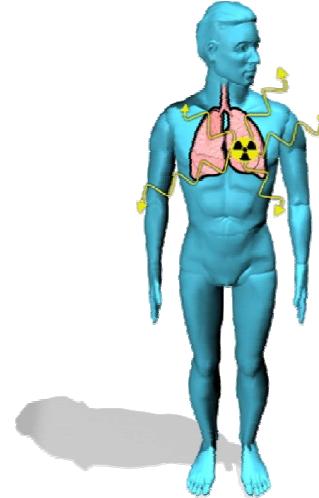




Modes of Exposure



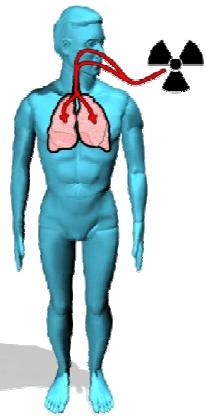
External



Internal

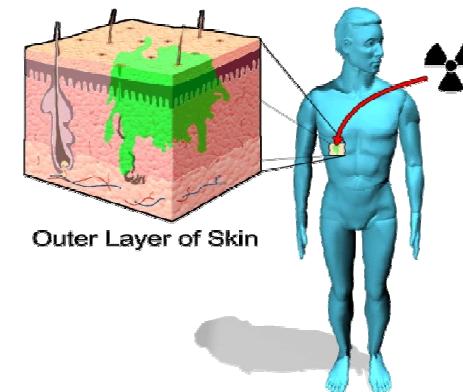
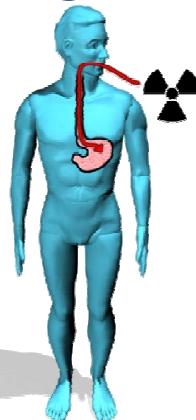


Internal Exposure Pathways



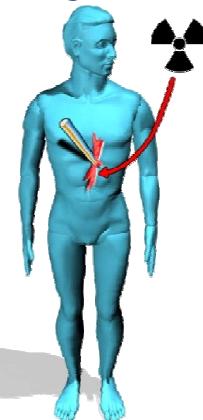
Inhalation

Ingestion



Absorption

Injection





Exposure Considerations

- Typically involves DU ammunition residues
- Estimated annual exposure – fractions of milliSieverts (mSv) (below doses from natural sources of radiation)
- Prolonged skin contact only possible exposure pathway of radiological significance
- Chemical toxicity is prevailing concern
- Kidneys are the target organ of potential damage
- Exposure assessments based on environmental monitoring may help with reassurance of public



Protective Measures

- Qualified experts identify affected areas
- Monitor affected areas and where *possible and justified* decide to:
 - restrict access to affected areas
 - clean-up of affected areas
- Raise public awareness – risk communication campaigns
- DU Fact Sheets – where, what, universal precautions



Protective Measures

- Important in areas where scrap metal is collected and melted for sale (toxic vapors)
- Particular emphasis placed on protection of children (typical hand-to-mouth activities)
- Personal hygiene is most effective means
- Other hazards may exist
- Use Lessons Learned
- Authorities control and regulate activities

