Nuclear Waste Disposal and the Role of Science

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What is risk?

Risk = Probability \times Consequence

How likely is it that something bad will happen?

How bad would it be if it happened?

Benefits

Choices
Nuclear Power Plant Electricity Generation
Waste from Coal and Nuclear Plants

Coal

20 tons of coal

Nuclear

23 nuclear fuel pellets
What do we do with the waste today?

- Storage Pools
- Dry Cask Storage
Where is the waste today?

http://www.ocrwm.doe.gov/info_library/newsroom/photos/photos_natmap.shtml#
Yucca Mountain Repository

Yucca Mountain

U.S. proposed underground geologic repository for high-level radioactive waste

Nevada Test Site
Nellis Air Force Base
Las Vegas
Is Yucca Mountain Safe?
Our science says: YES

Risk = Probability \times \text{Consequence}
How big a risk are we willing to take?

Risk = Probability x Consequence

Determination of risk: Responsibility of scientists

Value judgments on the benefits: Societal judgment

Benefits

Advantages of Solving the Nuclear Waste Problem
- Expanded use of clean nuclear energy
- Avoidance of carbon emissions
- Safety – waste is isolated from people
- Intergenerational equity
What do you think?