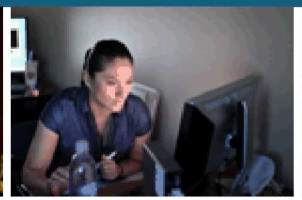
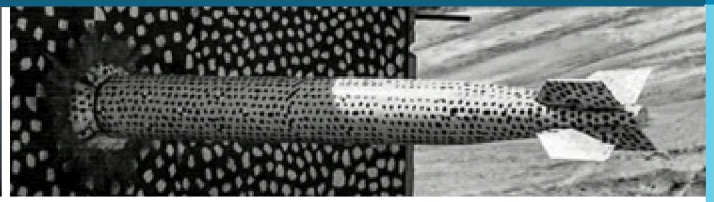
SAND2018-12922C

Radiological Threat, Where We Have Come From and a Path to the Future





PRESENTED BY

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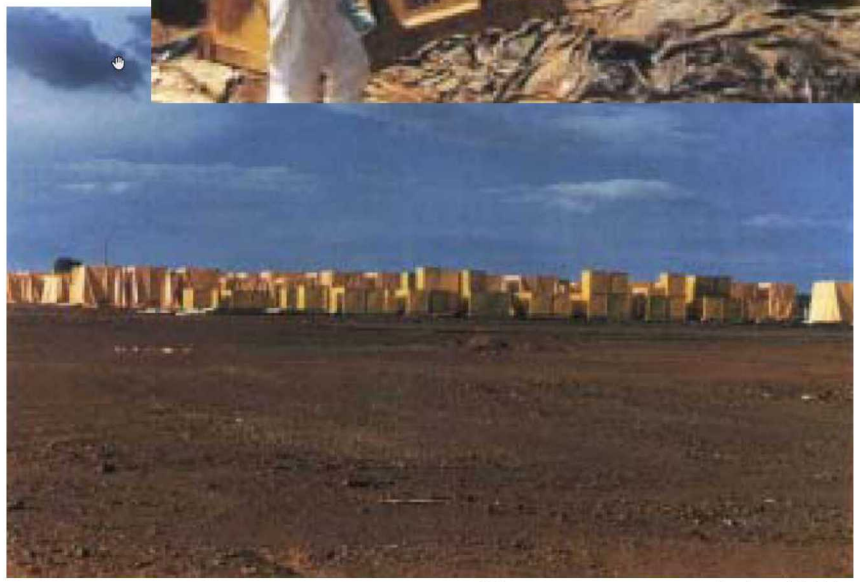
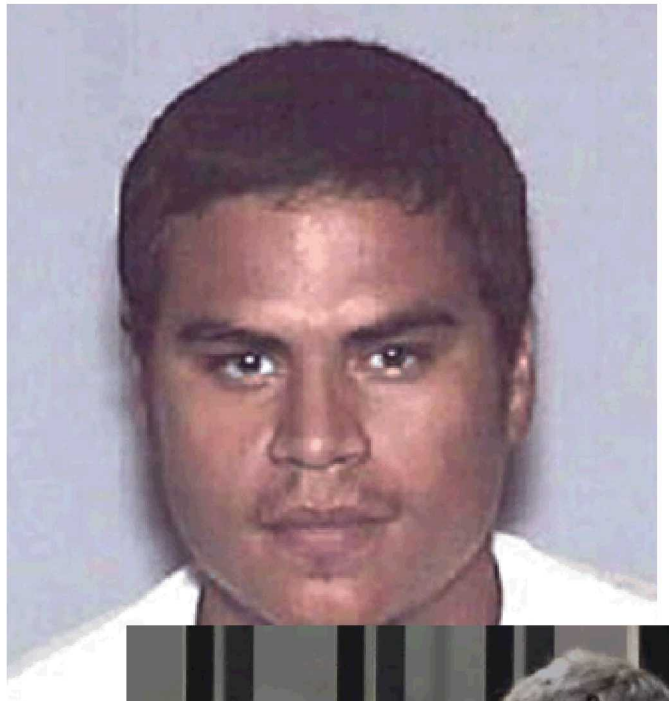
The Juaŕez and Goiania accidents helped drive recognition of the threat.

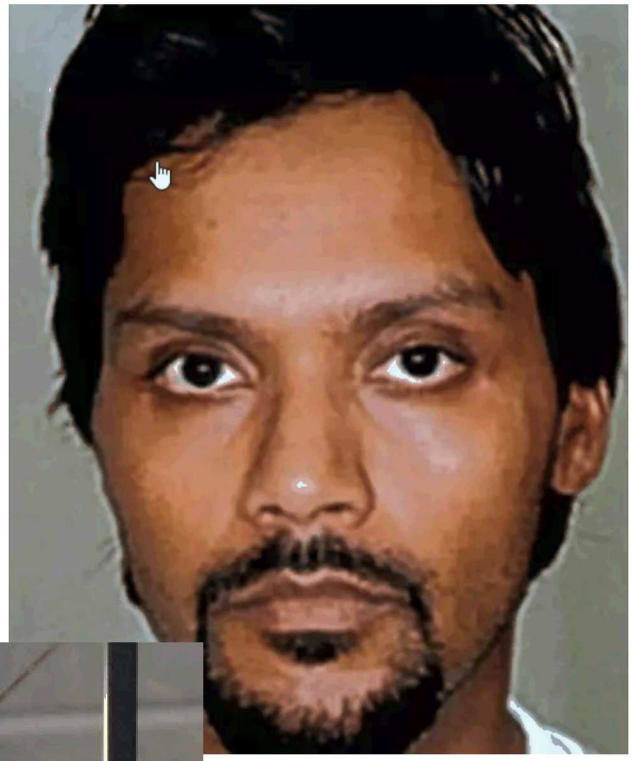
Photos courtesy of CNSNS

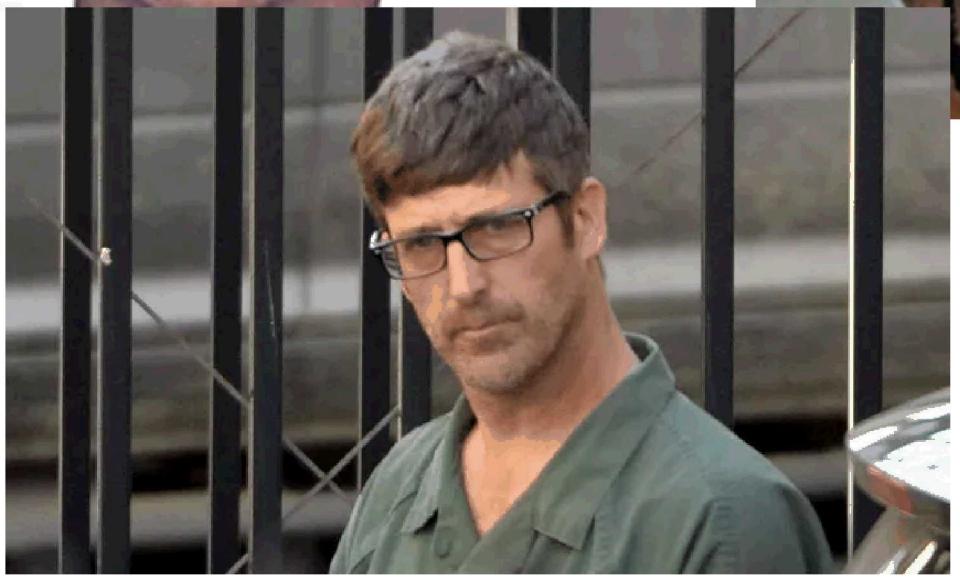


Photos courtesy of the IAEA

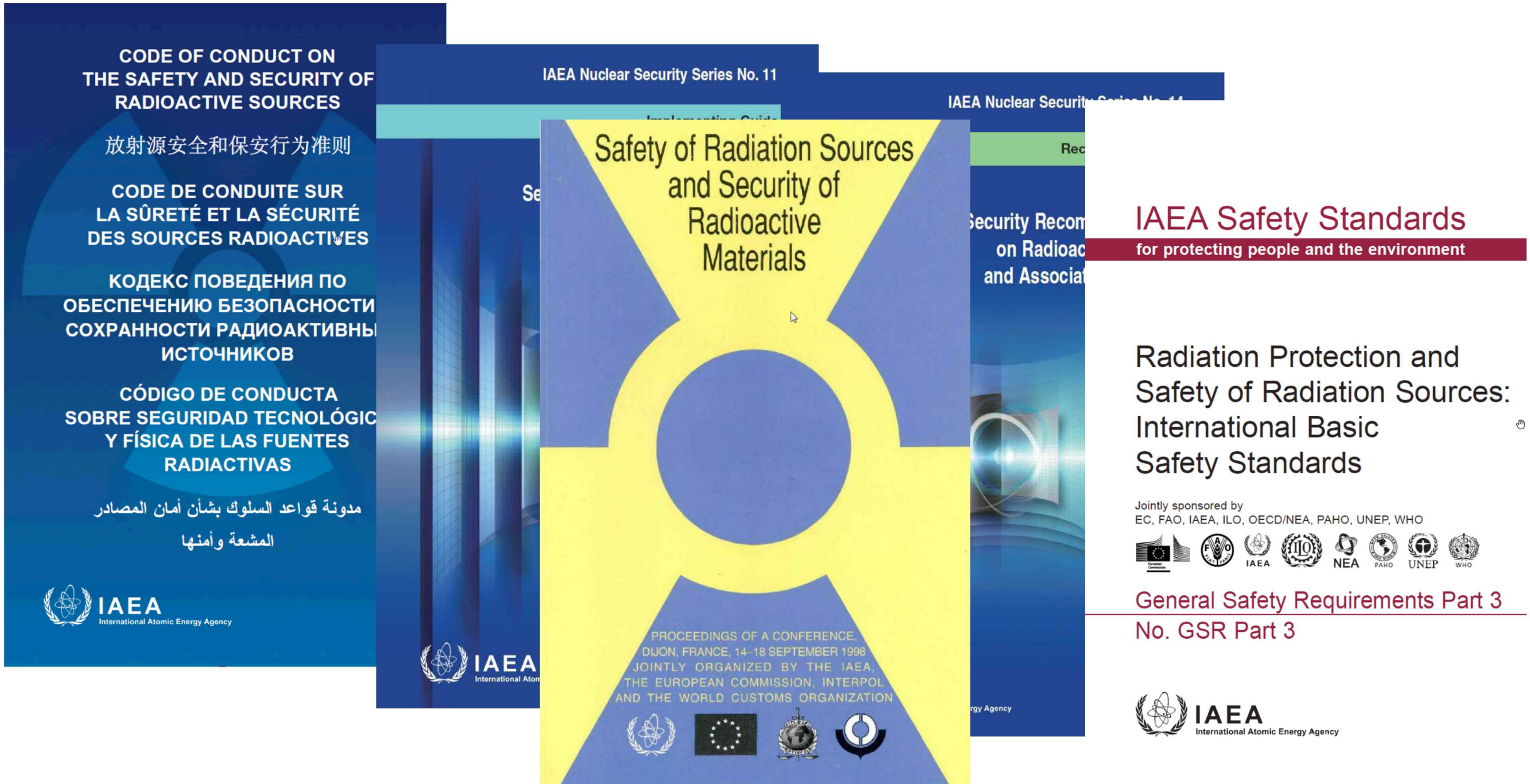
Since 2002 there have been incitements and plots to use radiation.







The 1998 source security conference began the IAEA's continuing efforts.



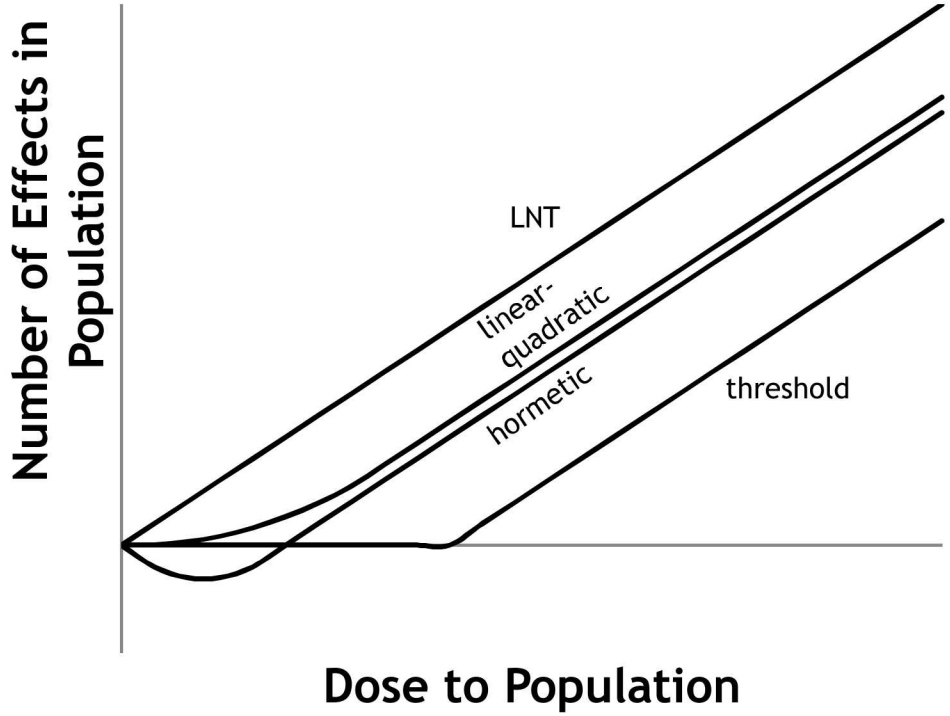
Actions for response efforts are guided by risk as defined by dose.

Phase	Protective Action Recommendation	PAG, Guideline, or Planning Guidance
Early Phase	Sheltering in place or evacuation of the public	PAG: 10 to 50 mSv projected dose over four days
	Limit emergency worker exposure	Guideline: 50 mSv/year
Intermediate Phase	Relocation of the public	PAG: >20 mSv projected dose in the first year, 5 mSv/year projected dose in the second and subsequent years
	Limit emergency worker exposure	Guideline: 50 mSv/year
Late Phase	Clean-up	Planning Guidance: Brief description of planning process.

Linear non-threshold risk parameters show little risk for small doses.

Normal and excess lifetime solid cancer incidence and cancer-caused deaths per 100 mSv (20 mSv) (Data derived from BEIR VII).

	Males	Females
Excess incidence % risk	0.8 (0.16)	1.3 (0.26)
Normal incidence rate %	45.5	36.9
Excess death % risk	0.41 (0.08)	0.61 (0.12)
Normal death rate %	22.1	17.5



There are some remediation guidelines but no threshold standard.

A successful remediation requires meaningful standards, education, and communication.

Educate the public on the risk of radiation exposure. This should include radiation types and shielding; dose, dose rate, and dose effects; background radiation; and radiation-induced cancer. Also provide information on what the response to events would look like and remediation following events.

Re-examine action guidance in terms of defining an acceptable risk for individuals, especially in comparison to the risk of evacuation or relocation for long periods. It may be appropriate in some cases to have radionuclide-specific guidance.

Develop a remediation standard that includes sensible long-term dose rates. It is likely that many — perhaps a majority — of affected individuals would accept additional risk to be able to re-inhabit their homes.