Can Nuclear Safety Culture Be Used To Increase Public Acceptance of Nuclear Power?

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Principles of Safety Culture

Development of a safety culture depends on

- Knowledge and awareness of the hazard
- Understanding in which situations the hazard results in a risk
- Understanding how the risk can be minimised
- Leadership built on trust
- Learning from mistakes of the past
- Effective communication

Public Perception

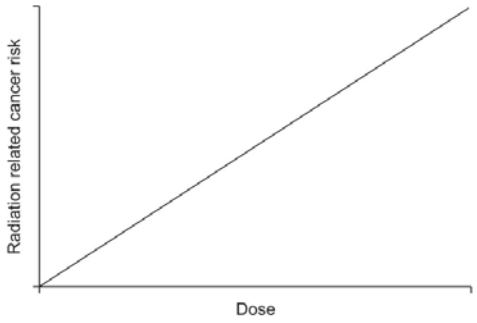
Knowledge and awareness of the hazard

- Public show heightened awareness of the hazard of man-made radiation relative to radiation from natural sources

- Need to correct misconceptions around “man-made” and “natural” radiation
- Could learn from Pharmaceutical industry on this
- Association of hazard with risk is down to belief rather than evidence

When does the hazard become a risk?

- Lack of understanding between dose and effect
  - Caused by the LNT hypothesis (radiation is dangerous at every level)



- Need to provide better illustration of potential risks at low levels
  - Infographics better than words
  - Compare risks and doses with everyday risks and exposures

Radiation and cancer risk

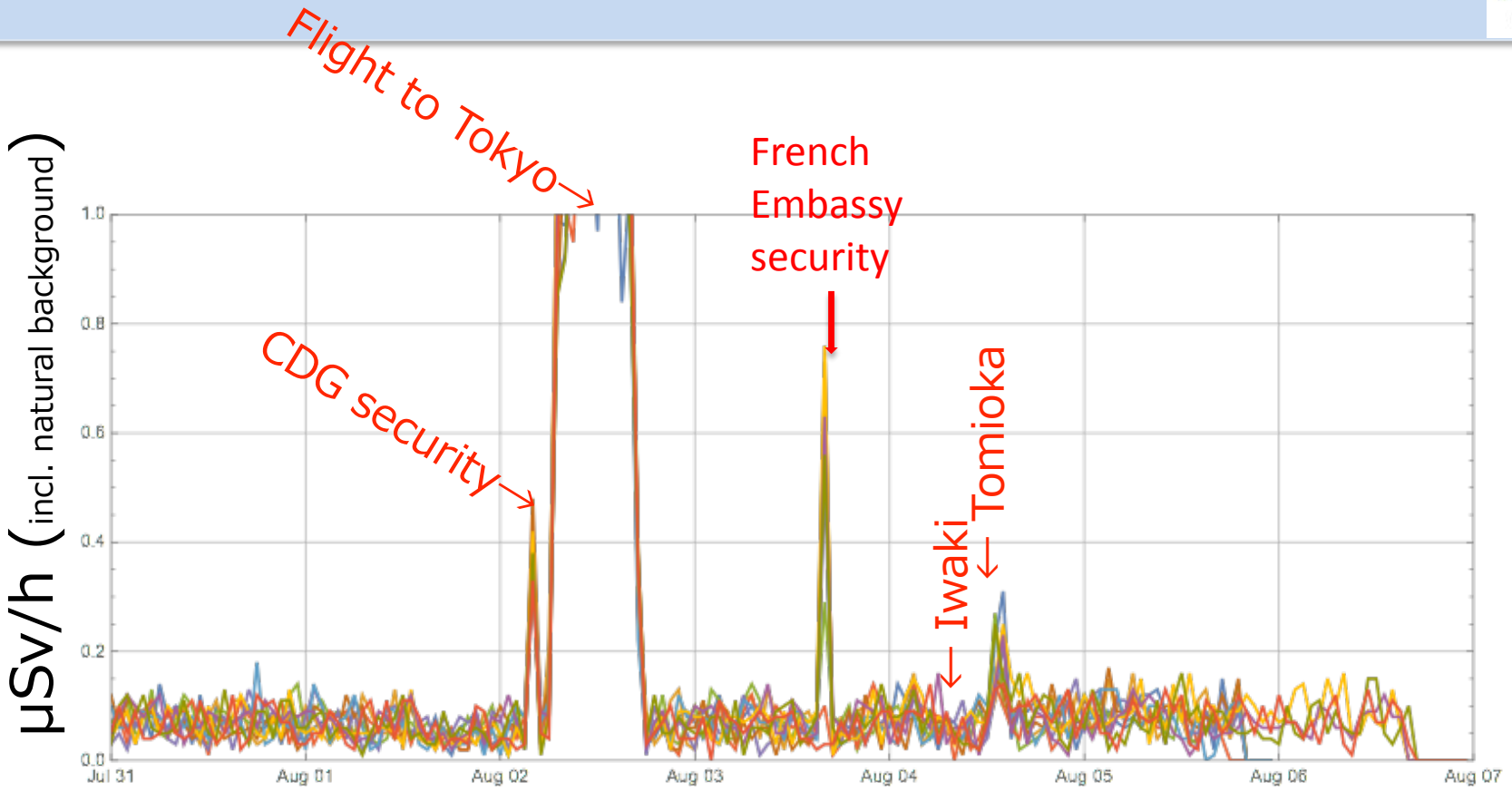
Health Risks from Exposure to Low Levels of Ionizing Radiation: BEIR VII Phase 2. Washington, DC: National Research Council; 2005. National Research Council, Committee to Assess Health Risks from Exposure to Low Levels of Ionizing Radiation.

Risks of radiation compared with other health risks

Risk scenario	Average Years of Life Lost (YOLL)
Smoking Male doctor who is a lifetime smoker compared to non-smoker.	10
Obesity White male aged 35 who is obese (BMI = 30.0–39.9) or severely obese (BMI >40): risk relative to BMI = 24.	Obese: 1–4 [a] Severely obese: 4–10[a]
Radiation Atomic bomb survivor who was in the most exposed group: within 1500 metres of the hypocentre. Shielded whole body kerma > 1 Gy, mean 2.25 Gy.	2.6 (1.3–5.2)[a]

NB Radiation doses from nuclear accidents much lower than from A-bomb, so risk even lower

J Smith http://bmcpublichealth.biomedcentral.com/articles/10.1186/1471-2458-7-49



Courtesy Prof Ryogo Hayano and Dr Masaharu Tsubukura
http://journals.sagepub.com/doi/pdf/10.1177/0146645316666493

Understand how the risk can be minimised (learnt from previous accidents)

Information provided to local communities via stakeholder groups on what to do in the event of an accident - advice given before the accident occurs!

- Shelter inside buildings
- Orderly evacuation for the short term (?)
- Minimise consumption of local food rich in iodine (milk, leafy vegetables)
- Don't panic – will result in many more casualties than the radiation exposure

Similar to the way we would deal with a chemical exposure

Leadership built on trust

Public interaction built on trust

- Trust of those running the plant (general problem with big industry and the public)
- Trust of those regulating the industry – regulators must have teeth and use them!
- Trust of workers within the plant – encourage the workforce to interact with local and more distant communities
- Trusted communicators – often those not part of the industry or government.
- **Find a public figure who understands the energy debate and can communicate on risks and benefits**

Effective communication

- Don’t compete with wind and solar – diversity is key to a successful energy policy
- All methods of energy generation have risks and benefit

- Need to balance effects on our ecosystem with the risk of lack of energy – everything pollutes to a degree
- Effects of CO2 and particulate pollution maybe catastrophic for life on earth (not just humans!)

Take home messages

- Don’t wait for the next accident – start a dialogue now with all levels in society about energy production in Japan
- Safety culture results in resilience – it takes a long time to instill, trust takes even longer
- The internet means everyone has a voice and expects their voice to be heard
- Hearts and minds will only change by dialogue – listen before you speak

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English

Are Humans Worse than Chernobyl?