

**Contradictions and concerns calling for an
integration of social sciences and nuclear/RP
research**

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Nuclear and social sciences risk research

- 40 years + of risk management and communication research (perception, amplification, governance, participation, ethics, etc.)
- Often developed in response to challenges presented by nuclear energy production
 - low probability of accident vs. high consequences
 - symbolic association with warfare

Impact of research: Where do we stand today ?

- Continuous technical improvements of reactor safety, high degree of performance and competence at the technical level – High Reliability Organizations
- Successful integration of human and organizational factors into design and operations (e.g. safety culture framework, first developed within nuclear, now used by all major industries)
- But nuclear and society ...



Example: Fukushima consequences

- Social disruption, local populations affected, large populations concerned, intense media reporting of the accident as a major disaster, economic and trade relations perturbed...

--- **VS.** ---

- Health impact not measurable as estimated doses seem too small (Boice, 2012)
- Risk to the general public inside and outside Japan is minimal with no anticipated increases in cancer rates (WHO, 2013)

US Navy Operation Tomodachi



- 2011 quake and tsunami rescue
- 100's of sailors who took part say they were exposed to dangerous levels of radiation
- They report symptoms and outrage about: Rare cancers, blindness, birth defects and now, two deaths
- 2014: these U.S. Navy Sailors sue Japan Power Co. for radiation exposure
- Navy response: Estimated exposures for approximately 75,000 U.S. personnel during Operation Tomodachi did not present any risks greater than risks normally accepted during everyday life.

Operation Tomodachi – Risk communication?



- Could Navy personnel have been briefed in 2011 ?
- Would this have better prepared them to foresee that within such a population, a proportion of symptoms or deaths were to be expected?
- Would it have facilitated a satisfying dialogue about the meaning of their service and the societal recognition they deserved?

With such contradictory elements, How to:

- Develop 'risk culture': shared understanding that there are dangers and also protective actions to be taken by institutions and individuals
- Generate and communicate reliable information on possible health risks associated with low dose exposure? (*both a scientific and societal challenge*)
- Avoid reducing the two contradictory elements of reality ('*The public is irrational,*' or: '*WHO is sold out,*' or: '*The Navy does not tell the truth*')
- Hold these elements of reality together in nuclear research and radiological protection ?

Nuclear Village: A society within society ?

- Nuclear Village in Japan: Nuclear supported by Parliament, utilities, operators, administration, financial sector, media, academia... leading to “regulatory capture” (Kurokawa Commission, NAIIC, 2012)
 - Similar phenomena in Europe ?
 - Could change be considered from inside nuclear institutions (established long ago) ?

Nuclear risk communication: Framing and care

- Tension between disclosure and sensitivity of populations explicitly considered 57 years ago:

*“Although the case **in favour of concealing nothing from the public** appears to be unanswerable, there is, nevertheless, a duty to study the psychological principles of the presentation of anxiety-raising information in relation to the **capacity of the public to endure it**”*

(WHO, 1958)

- First half of the statement: Fully developed over the years – Continuous movement towards transparency
→ What happened to the 2nd half ?

Risk and concern: Exposure to radiation and/or to bad news?

- Social representations research has emphasized that an object's stands out and mobilizes attention, not just by its own characteristics, but especially by its position in the cognitive space of a population that may be concerned or affected by this object
 - “China on fire” vs. “A nuclear accident somewhere is a nuclear accident everywhere”
 - The concept of **socio-cognitive exposure** characterizes the sustained exposure of populations to potentially worrying information (vs. actual exposure to radiation)
- Major challenge for risk communication/research: the blurring of risk and concern

Stigmatization vs. solidarity

- Stigmatization: Image costs (e.g. reduction of non-contaminated exports and tourism activity) represent 40% of cost of a nuclear accident scenario in France (Pascucci-Cahen & Momal, 2012)
 - Solidarity: after Fukushima, help from state officials , nuclear organizations and experts, civil society volunteers ; Tokyo to host 2020 Olympic games (Fukushima some 145 miles away)
- Better document solidarity
- Research on solidarity conditions which would increase resilience for both local and global populations (e.g. for accident preparedness)

Conclusion: Integration of social sciences in nuclear research and radiological protection 1/2

- Nuclear risk communication inescapably faces **conceptual** contradictions, dissonance, tensions...
- Approaches to contradictions
 1. Suppress one side
 2. Cope with the social psychological consequences (polarization, opposition, conflicts...)
 3. Treat both sides together as part of reality
- The 3rd option implies social sciences research drilling deeper into the phenomena at hand (e.g. post Fukushima: social disruption ; removal of distance ; collapse of safety myth...)
- Conceptual development needed to address **risk**, **concern** and “**capacity to endure**” in nuclear risk communication

Conclusion: Integration of social sciences in nuclear research and radiological protection

2/2

- Technological and radiological issues are socially embedded, and social sciences should be engaged at the start of anything
 - Interdisciplinary approach: Social sciences associated with otherwise technical nuclear research projects
 - Participation of other nuclear scientific and technical personnel
 - Develop **reflexivity** of “Nuclear Villagers”:
 - To reduce nuclear/society gap through changes from **inside** nuclear institutions (not from the outside public only)
 - To verify/remedy disconnection from society at large
- N.B.: ongoing ARCADIA study with nuclear scientists does not validate this social disconnection hypothesis – feedback might reinforce competencies