

This item is the archived peer-reviewed author-version of:

Risk communication in the case of the Fukushima accident : impact of communication and lessons to be learned

Reference:

Perko Tanja.- Risk communication in the case of the Fukushima accident : impact of communication and lessons to be learned
Integrated environmental assessment and management - ISSN 1551-3777 - Hoboken, Wiley-blackwell, 12:4(2016), p. 683-686
Full text (Publisher's DOI): <http://dx.doi.org/doi:10.1002/IEAM.1832>
To cite this reference: <http://hdl.handle.net/10067/1358020151162165141>

Title: Risk Communication in the Case of the Fukushima Accident: Impact of Communication and Lessons to be Learned

Running head: Lessons from Fukushima Risk Communication

Dr. Tanja Perko

Nuclear Science and Technology Studies

Institute for Environment, Health and Safety

Belgian Nuclear Research Centre SCK·CEN

Boeretang 200, B-2400 Mol

Belgium

Tel.: +32 14 33 28 51

E-mail: tperko@sckcen.be

Web: <http://www.sckcen.be/>

University of Antwerp

Media, Movements and Politics research group

Web: <http://www.m2p.be/>

Abstract:

Risk communication about the Fukushima accident was often not transparent, timely, clear nor factually correct. However, lessons related to risk communication have been identified and some of them are already addressed in national and international communication programmes and strategies. The accident may be seen as a practice scenario for risk communication with important lessons to be learned. As a result of risk communication failures during the Fukushima accident, the world is now better prepared for communication related to nuclear emergencies than it was 5 years ago. The present study discusses the impact of communication, as applied during the Fukushima accident, and the main lessons learned. It then identifies pathways for transparent, timely, clear and factually correct communication to be developed, practiced and applied in nuclear emergency communication before, during and after nuclear accidents.

Key words: Fukushima nuclear accident, risk communication, risk perception, mass media, nuclear exercises

Introduction

Risk communication during and after the accident in Fukushima was confronted with several challenges: emergency management failure by emergency management groups to communicate protective actions to the public during the Fukushima accident (e.g. evacuation or intake of potassium iodide), failure to communicate uncertainties related to the on-going emergency (e.g. inadequate information related to radioactive release), inability of experts to admit uncertainties related to health effects of radiation (e.g. low radiation doses effects), inability to deal with public fears (e.g. how the contamination from the accident will affect children's health, including thyroid abnormalities), and lack of stakeholder involvement in decision-making at a later stage (e.g. lack of involvement of women in decisions related to the return to evacuated villages). This resulted in improper public response and difficulties in the recovery from the Fukushima accident. The communication failures contributed to citizens' anxiety and distrust in emergency management, the government, the safety regulators, the experts and the nuclear industry worldwide (Ropeik 2011; NAIIC 2012; Figueroa 2013; Kim. YOUNGHWAN, Kim. MINKI et al. 2013; Siegrist and Visschers 2013), and had a negative impact on stakeholder involvement processes for the remediation and recovery of contaminated villages (Hobson 2015).

Yet, the accident can be seen as a practice scenario for risk communication, with important lessons to be learned. Due to Fukushima, national and international authorities, various organisations and NGO's worldwide - for instance IAEA (IAEA 2013), the Red Cross (IFRC 2015) and the International Radiation Protection Association (Coates, Webb et al. 2012)- reviewed risk communication plans and improved strategies for communication in nuclear emergency preparedness and response. Nuclear emergency authorities acknowledged the need to include communication aspects in emergency preparedness exercises and trainings (Perko, Raskob et al. 2016). Open-source, citizen-

science-centred radiation mapping solutions were developed through a process of collaborative open innovation and citizens science entered the radiation protection field, for instance the case of Safecast in Japan (Brown, Franken et al. 2016). In addition, investments in risk communication research and improvements in the coordination of risk communication before, during and after nuclear emergencies were ensured (e.g. FP7 projects EAGLE, PREPARE, OPERRA supported by European Commission).

The communication gap between experts and general public should be addressed

Risk communication aims to convey accurate information, such as the need to take adequate protection measures during emergencies and to make informed decisions about their health and safety in the recovery phase, to non-experts. In Japan, the speed of information in the evacuation and sheltering areas varied significantly, residents received no further explanation of the accident or evacuation directions, or were unable to understand communicated messages about protective actions applied (NAIIC, 2012). Hence, it is of utmost importance that such information is given in clear language without jargon or technical terms. Otherwise, necessary information is not understood, remembered or recalled. For instance, the term “sheltering” could be explained as: “go in the nearest building, close windows and doors, switch off ventilation systems, and stay informed by following different communication channels including the mass media.” Conversely, studies demonstrated that communication about radiological risks between the experts and the general public in Japan and worldwide presented a huge gap in mutual understanding (Slovic 2012; Tateno and Yokoyama 2013; Istenic and Kralj 2014). For instance, research by Tomkiv et al. (2016) and Perko, Tomkiv et. al (2015) confirmed that the use of a variety of units and technical terms in public communication about Fukushima contributed to misunderstandings and confusions worldwide. Due to this, a number of mistakes and misrepresentations appeared in public communication. This included referring to non-existing norms, for instance norms for radionuclide content in seawater, using the wrong norm, or a

reference to the 'normal level' without explaining what is meant by a normal level (Tomkiv, Perko et al. 2016).

In addition to this communication gap, Perko (2014) identified also a risk perception gap between employees of nuclear installations and the lay public, with lay public having a rather high perception of radiological risk due to the Fukushima accident in a European country that was not affected by Fukushima.

Perception of the Fukushima accident was, among others, also influenced by mass media reporting. Recent research by Vyncke et. al (2016) confirmed that some media channels had a significant influence. Television and interpersonal communication were both related to higher perception of radiological risks from Fukushima, while various, less used, online sources (with YouTube as probably the most important) were related to lower risk perception of the accident, indicating the importance of mass media communication.

Mass media communication is an opportunity and a challenge

Communication with mass media during and after the Fukushima accident presented both a challenge and an opportunity for emergency authorities in Japan and globally. On the one hand, mass media communication offered great opportunities for emergency management since it is by definition capable of reaching a large number of people simultaneously (Wimmer and Dominick 2006). In the early phase of the Fukushima accident, mass media increased the awareness and understanding of the need for protective actions and influenced the response of directly or indirectly affected population. For instance, mass media reported about the evacuation of foreign nationals from Tokyo (a decision taken by Germany) and appealed against a boycott of Japanese products in Belgium. In the medium and long term, media can facilitate the remediation process and the return to normal life, for instance by on-line sharing of information about radiological contamination measurements, e.g. the Safecast project in

Japan, which assists residents in identifying radiological contaminated hotspots within as well as outside the zones already remediated or to still to be remediated. Effective media communication can support the implementation of protective measures to reduce public fears, and thus minimize the chance of negative psychological effects, and help sustain public confidence in the organizations that are responsible for emergency management (Perko 2012). Moreover, emerging and evolving communication technologies, such as social media, offer the possibility of improved nuclear emergency communication, as these technologies have the potential for increased information capacity, dependability, and interactivity (Jaeger, Shneiderman et al. 2007).

On the other hand, mass media communication during Fukushima resulted in a challenge for the emergency authorities since communication has evolved into a multiple-directional process where information was disseminated at an, often, uncoordinated and rapid pace, and was able to easily reach variety of audiences: affected, indirectly affected and not affected by radiological risks (Mays, Valuch et al. 2016). Social media have given all users a virtual platform to express themselves and to share information, in what is known as citizens' journalism. An overload of (miss)information coming from various sources (e.g. authorities, expert organisations, traditional media, individuals, inhabitants, NGOs etc.) made it difficult for people to differentiate which information is correct (Prezelj, Perko et al. 2016). Moreover, the rise of social media during Fukushima accident has enabled users to demand more transparent, high-speed communication and accountability from governments, public institutions and emergency managers. Social media caused intense time pressure and an additional personnel burden for emergency management communicators, requiring skills, training and resources from radiation protection communities and ethical deliberation of social media use (Perko, Mays et al. 2015; Gehner and Oughton 2016). The Fukushima experience proved that citizen-centred communication with social media integration is a must for risk communication about nuclear or radiological emergencies. An

example is a massive use of the International Atomic Energy (IAEA) Facebook for public communication, which was for a limited time period, due to high communication overload, the only IAEA operational communication channel. To use or not to use social media is no longer a matter of choice for official authorities. Traditional media and journalists have become just one of the channels of communication and people expect official authorities to provide information via alternative channels as well.

Need for a new way of communication: citizen-centred communication

Low or no engagement of the affected citizens, especially in a later phase was recognised as one of the biggest pitfalls of communication (Hobson 2015). Stakeholder engagement was often seen only as a “monologue” from official experts to citizens, which led to a situation where there was no other way of defining risks other than the ones already framed and elaborated by the authorities (Shirabe, Fassert et al. 2015).

Nowadays risk communication related to nuclear emergencies should be developed and prepared in collaboration with stakeholders (e.g. Verhaegen and Bergmans 2015) and citizens' involvement in decision-making related to recovery is crucial. Citizen-centred communication about radiological risks should address socio-political and ethical issues, and the communication strategy should deal with constraints associated with stakeholder communication and engagement, for instance low motivation to participate in the process, low trust between stakeholders, different views and perspectives among stakeholders, representation issues (who presents a stakeholder group) etc. (IAEA 2016).

Emergency communication should be prepared in advance, communication aspects should be trained and practiced

|

From a communication point of view, Japanese authorities, nuclear safety authorities worldwide, traditional media and the public were unprepared for a nuclear accident of the magnitude experienced in Fukushima. Both the Japanese national and the international communicators have been slow to provide the clear and open communication needed to put the accident in context (McKinley 2011; Ng and Lean 2012). Because the communication approaches were not prepared in advance, trained and tested in exercises. Communicators were not ready to provide information to the public in a transparent, timely and understandable way. For instance, nuclear managers in different countries including Japan were not prepared to communicate in different languages (e.g. English). They did not have basic templates for radiological risk communication ready to be used (e.g. responses for frequently asked questions), and were not active participants in the social media sphere during the accident (e.g. without Twitter accounts). Roles and responsibilities for internal communication were often unclear (e.g. among first respondents) and radiation protection experts were not trained for media or public communication.

Materials and training should be prepared in advance by responsible authorities and made easily available to the public and media on a general basis (e.g. on web pages of nuclear safety authorities), and communication aspects should be exercised. Lessons from Fukushima should be used as a basis for developing communication material, which should be tested in future nuclear emergency exercises, preferably with a variety of different stakeholders, including the media; it can also serve to inform experts' trainings in public speaking and justification of investing in social media communication (Istemic and Kralj 2014; Mays, Valuch et al. 2016; Perko, Raskob et al. 2016; Prezelj, Perko et al. 2016). Effective public communication in emergency situations is dependent upon the level of preparedness of the organizations involved. Not only does this include planning, training and practicing for public communication in emergency response, it also depends on the strength of the overall communication programme and on a culture of transparency.

Fukushima will become a reference in risk communication for all future nuclear accidents

Studies in risk communication demonstrate that journalists and public use narratives drawn between present and past events (e. g. Zelizer 2004; Edy and Daradanova 2006; Robinson 2009). According to this, the research on media communication during Fukushima shows that the memory of the Chernobyl nuclear accident appeared in more than in every third article in Belgium, Italy, Norway, Russia, Slovenia and Spain despite the fact that Fukushima carried no direct radiological hazard for the newspaper's audience (Perko, Tomkiv et al. 2015). This indicates the Fukushima will become a reference in risk communication related to nuclear incidents and accidents as well. Consequently, risk communicators have to be well informed about all major nuclear accidents including Fukushima and be able to include and compare them with possible future nuclear emergencies.

References:

- Brown, A., P. Franken, et al. (2016). "Safecast: successful citizen-science for radiation measurement and communication after Fukushima." Journal of Radiological Protection **36**: 82-101.
- Coates, R., G. Webb, et al. (2012). "The world comes to Glasgow—the IRPA 13 Congress." Journal of Radiological Protection **32**: E1–E2.
- Edy, J. A. and M. Daradanova (2006). "Reporting through the lens of the past: from Challenger to Columbia." Journalism, **7**: 131-151.
- Figueroa, P. M. (2013). "Risk Communication Surrounding the Fukushima Nuclear Disaster: an Anthropological Approach." Asia Europe Journal **11**(1): 53-64.
- Gehner, M. and D. H. Oughton (2016). "Ethical challenges in social media engagement and research: considerations for code of engagement practices." Journal of Radiological Protection **36**: 187–192.
- Hobson, H. (2015). "Rebuilding Trust after Fukushima." Fukushima Global Communication Programme; Working Paper Series **4**: 1-7.
- IAEA (2013). Preparedness and Response for a Nuclear or Radiological Emergency in the Light of the Accident at the Fukushima Daiichi Nuclear Power Plant. REP/EPR. Vienna: 59.
- IAEA (2016). Advancing Implementation of Decommissioning and Environmental Remediation Programmes. Nuclear Energy Series No. NW-T-1.10. Vienna, Austria, IAEA: 116.
- IFRC (2015). Nuclear and Radiological Emergency Guidelines: Preparedness, Response and Recovery. Geneva, Switzerland, International Federation of Red Cross and Red Crescent Societies.
- Istemic, R. and M. Kralj (2014). Analyses of ETI material in EU related to Fukushima accident. EAGLE, D1.2. P. T. Brussels, Belgium, European Commission: 26.

- Jaeger, P. T., B. Shneiderman, et al. (2007). "Community response grids: e-government, social networks, and effective emergency management." Telecommunications Policy **31**(10-11): 592–604.
- Kim. Younghwan, Kim. Minki, et al. (2013). "Effect of the Fukushima nuclear disaster on global public acceptance of nuclear energy." Energy Policy **62**: 822–828.
- Mays, C., J. Valuch, et al. (2016). "Looking for citizen-centered communication: dialogues between radiological protection or nuclear safety specialists and media professionals." Journal of Radiological Protection **36**: 143–159.
- McKinley (2011). "Fukushima: Overview of relevant international experience." Genshiryoku Backend Kenkyu **18**(2): 89-99.
- NAIIC (2012). Fukushima Nuclear Accident Independent Investigation Commission Report. Independent Report. Tokio, Japan: 88.
- Ng, K. H. and M. L. Lean (2012). "The Fukushima Nuclear Crisis Reemphasizes the Need for Improved Risk Communication and Better Use of Social Media." Health Physics **103**(3): 307-310.
- Perko, T. (2012). Modelling Risk Perception and Risk Communication in Nuclear Emergency Management: An Interdisciplinary Approach. Antwerpen, Belgium, Universiteit Antwerpen.: 203.
- Perko, T. (2014). "Radiation Risk Perception: A Discrepancy Between the Experts and the General Population" Journal of Environmental Radioactivity **133**: 86-91.
- Perko, T., C. Mays, et al. (2015). "Mass and New Media: Review of Framing, Treatment and Sources in Reporting on Fukushima." Journal of Mass Communication & Journalism **5**: 252.
- Perko, T., W. Raskob, et al. (2016). "Improved communication, understanding of risk perception and ethics related to ionising radiation." Journal of Radiological Protection **36**: 15–22.
- Perko, T., Y. Tomkiv, et al. (2015). "Units related to radiation exposure and radioactivity in mass media: The Fukushima case study in Europe and Russia." Radiation Protection Dosimetry **164** (1-2): 154-159.
- Prezelj, I., T. Perko, et al. (2016). "The limits of public communication coordination in a nuclear emergency: lessons from media reporting on the Fukushima case." Journal of Radiological Protection **36**: 45–63.
- Robinson, S. (2009). "If you had been with us': mainstream press and citizen journalists jockey for authority over the collective memory of Hurricane Katrina." New Media & Society **11**(5): 795-814.
- Ropeik, D. (2011) "Poor Risk Communication In Japan Makes the Fear Much Worse." Psychology Today at: URL:<http://www.psychologytoday.com/blog/how-risky-is-it-really/201103/poor-risk-communication-in-japan-makes-the-fear-much-worse>
- Shirabe, M., C. Fassert, et al. (2015). "From Risk Communication to Participatory Radiation Risk Assessment." Fukushima Global Communication Programme Working Paper Series **21**: 2-8.
- Siegrist, M. and V. Visschers (2013). "Acceptance of nuclear power: the Fukushima effect." Energy Policy **59**: 112-119.
- Slovic, P. (2012). "The Perception Gap: Radiation and Risk." Bulletin of the Atomic Scientists **68**(3): 67-75.
- Tateno, S. and H. M. Yokoyama (2013). "Public anxiety, trust, and the role of mediators in communicating risk of exposure to low dose radiation after the Fukushima Daiichi Nuclear Plant explosion." Journal of Science Communication **2**: 1-22.
- Tomkiv, Y., T. Perko, et al. (2016). "How did media present the radiation risks after the Fukushima accident: a content analysis of newspapers in Europe." Journal of Radiological Protection **36**: 64–81.

Verhaegen, M. and A. Bergmans (2015). Dealing with Uncertainty: Involving Citizens in Emergency Planning in a Nuclear Municipality. International conference: RICOMET 2015: Risk perception, communication and ethics of exposures to ionising radiation, Brdo Congress Center, Slovenia, SCK-CEN, Belgium. Location: Brdo, Slovenia, date: 15-17 June 2015, Publisher, SCK-CEN, Belgium, page 63, URL: http://ricomet2015.sckcen.be/~media/Files/Ricomet2015/Book_of_Abstracts_final.pdf

Vyncke, B., T. Perko, et al. (2016). "Information Sources as Explanatory Variables for the Belgian Health-Related Risk Perception of the Fukushima Nuclear Accident." Risk Analysis (accepted for publication).

Wimmer, R. D. and J. R. Dominick (2006). Mass media research: An introduction. Belmont (CA), American Marketing Association.

Zelizer, B. (2004). "The Zapruder film: Reframing JFK's assassination." Journal of American History **91**(3): 1087-1088.