

# The Science and Technology Communication in a Post 3/11 World

## –How Can the Public Have Trust in Nuclear Experts?–

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Post March 11, many nuclear experts may be pondering, “what can be done to regain the society’s trust?” However, irrespective of what we say now, we must rethink everything from the perspective that words alone cannot be trusted. Instead of thinking of nuclear energy from the perspective of expert-driven promotion of scientific and technological understanding, the problem of nuclear energy must be rethought as a “trans-science” problem that can be posed as a question to science, but which science alone cannot answer. Herein, we will add some comments from such a perspective based on trans-science.

## I. Statements Without Self-Examination and the Message They Send to the Society

### 1. Statement Issued by the Atomic Energy Society of Japan and the Sense of Commitment

After the 2011 earthquake that occurred off the Pacific coast of Tohoku, many research communities (academic societies) issued statements concerning the disaster from their own perspectives. Similar to other societies, the Atomic Energy Society of Japan (AESJ) also published its statement on March 18, one week after the earthquake. The author of this paper read that statement as a member of AESJ, and could not help being uncomfortable, especially regarding the following lines.

*(Omitted) Through these activities, we promote dialog with citizens and an understanding of nuclear energy. (Omitted) We will play the role that is asked of us while remembering that nuclear energy is an indispensable technology for solving the energy problem of humanity, and we will continue to contribute to the development of the society with renewed resolve.* <sup>1)</sup> (Underline by the author)

At that time, only one week after the earthquake, the memory of the hydrogen explosion at the Fukushima Daiichi Nuclear Power Plant was still fresh, and not only the Fukushima Prefecture but the entire country of Japan was watching the progress of the situation at the power

plant with bated breath. The people in the vicinity of the power plant were not only forced to evacuate without much preparation, but were also faced with serious concerns regarding the effects of exposure on themselves and their families. Moreover, many people had to make a difficult decision to surrender the search for missing family in order to evacuate. The above-mentioned statement was issued under such circumstances. AESJ, which was considered to be equally responsible for this accident as the electricity company, definitely stated that “nuclear energy is an indispensable technology” even before the prospects for the resolution of the incident or a proper examination were made. Many reactions among academics stated that the authors of this statement lack consciousness in terms of self-responsibility. The author felt that such criticisms were warranted. Furthermore, these criticisms are still deserved currently, three months after the accident, when a prospect for the resolution of the situation is still missing.

## 2. Experts Who Express the Sense of Their Responsibility

Conversely, several academic societies expressed their responsibility as experts. For instance, the president of the Physical Society of Japan (JPS) stated in the text he published in the Society’s journal on March 22<sup>2)</sup> that:

*Under such circumstances, the Physical Society must tackle a huge problem. First, either as JPS or as physicists we must engage with the problem at the Fukushima Nuclear Power Plant in a correct manner, even if only belatedly. The usage of nuclear energy was pioneered by physicists. Thus, our responsibility is grave. The danger at the Fukushima Power Plant is an ongoing problem. However, physicists must think of medium to long-term problems. Physicists tend to close their eyes to nuclear power generation. This is the moment for us to seriously reengage with it.* (Underline by the author)

Moreover, in the joint emergency statement issued by the following three academic societies<sup>3)</sup>: the presidents of the Japan Society of Civil Engineers, the Japanese Geotechnical Society, and the City Planning Institute of Japan, stated that:

*This earthquake is said to be unprecedented and unexpected. When we use the word unexpected as experts, we should not use it as an excuse or justification. When facing such a great earthquake, we must fear the force of nature, as our ancestors did, and remind ourselves that it is important to have a perspective that not only focuses on hardware (disaster prevention facilities) but also combines it with software.* (Underline by the author)

Naturally, every academic society is facing a different situation, and hence, they cannot be generalized. However, the important difference between the statement issued by AESJ and these two statements is that the latter two clearly express their reflection on their research or words. Furthermore, it is the difference in whether the reader can feel the regret and agony behind the words of the experts. In the post-3.11 era, “trustworthiness of nuclear experts” will become an important theme in both the remediation of the environmental impact of the Fukushima Daiichi Nuclear Power Plant Accident as well as social consensus on building for the future usage of nuclear energy. However, is it possible for the society to trust a group of experts who refuse to reflect on themselves even after experiencing such an unprecedented disaster?

One of the conclusions that the author arrived on, after many years of being involved in the “dialogs” between nuclear energy experts and the local citizens near the power station sites, is that without reflecting on past comments and sharing this reflection with people who are non-experts, it is unlikely that the experts will be trusted by the people in the true sense<sup>4)</sup>. Instead of the experts who know the unshakable truth and educate non-experts, experts who

struggle with the society and search for a better existence of nuclear energy together with better technology are required even more after facing this unprecedented disaster.

Instead of forcing the belief on the society that “nuclear energy is an indispensable technology for solving the energy problem of humanity”, and self-righteously defining one’s role as “contributing to the development of the society”, being humble enough to think that if necessary for the society, we will dedicate ourselves to helping the society with a whole-hearted spirit. After 3.11, such humility is probably the only possible starting point for any dialog between experts and citizens.

### **3. Self-Protection of Experts and Its Social Appraisal**

Similar issues are not unique in the field of nuclear energy. The responsibility of the unprecedented damage caused by the 2011 Tohoku Earthquake is not attributed to the nuclear energy experts exclusively.

The joint statement issued by the 34 academic societies led by the Chemical Society of Japan (including the AESJ) <sup>5)</sup> is as follows: “Japan will not stop the progress of science–Academic societies will build a hopeful future of Japan with students and young researchers.” Consequently, the following three points were proposed: (1) support for students and young researchers; (2) support for early repair/recovery of universities and research facilities damaged by the earthquake and reestablishment of the educational and research system; (3) transmitting accurate information to prevent national/international reputational damage of nuclear power plants following the disaster. One can find the same problems here as those in the statement issued by AESJ. In this joint statement of the 34 academic societies, a group of experts with diverse domestic expertise not only failed to appropriately predict the occurrence of the 2011 Tohoku Earthquake but also failed to predict the tsunami it triggered and prepare concrete measures (including countermeasures for nuclear power plants). Moreover, they did not reflect on any of these failures. On the contrary, in points (1) and (2), the statement only discusses the necessity of social support for scientists, including young researchers and scientific researches. From the perspective of the readers of the published statement (the society), its contents are readily perceived as self-protection.

Naturally, repair/recovery of the environment for scientific research is one of the important issues. However, when the society is asking questions about the *raison d’être*, i.e., the reason for the existence of the research itself, such as “what is scientific research? How can it/did it contribute to our society?” Under such questioning, the social impact of making the first statement that focuses on self-protection without reflection is significant. At the very least this is not a proposal that should be prioritized. From the society’s perspective, science and technology experts are on the same side as the government and administrative agencies, i.e., the side that caused this unprecedented natural disaster and man-made atomic power fatality. In a sense, the experts do not have the right to say, “Japan will not stop the progress of science (technology)” at instance. Rather, they should say “stop the progress of science (technology) for the time being” and ask themselves what science can do for the resolution of this situation and true restoration of the disaster-stricken area. Unless they are judged by the society, they cannot begin anew.

### **4. Limiting the Knowledge Injection Model**

Another problem in the statement issued by the 34 academic societies lies in point (3) : reputational damage. To begin with, what is “accurate” information dissemination under such

a circumstance? Our society has seen information that was said to be accurate being overturned many times in the last three months. Moreover, there is no agreement on the question, “what is accurate knowledge,” in terms of the effect of radiation exposure on human health influence even among the so-called experts.

The author has been repeatedly arguing since March 11 that while a certain level of nuclear knowledge is necessary, injecting “(purportedly) correct” knowledge alone cannot remove all the fear concerning radiation. Particularly, in a society where a nuclear power plant accident that has never been experienced by human beings became reality, to blindly believe the “correct” knowledge some experts try to unilaterally force upon the society is extremely difficult. In a situation where everyone tries to comprehensively judge the situation not only through official announcements but also through counter information (including warnings for danger), what is required of experts is not the offer of exclusively correct information but to the offer of information with detailed proofs that can be used as for a basis to judge what is correct. At one of the dialogs organized by the author between experts and the residents of the nuclear power plant sites, one of the residents said the following: “I think in the end, the opinion of an expert is neither right nor wrong, but it is just that person’s personal view. And it is up to me to decide whether it is correct or not.”<sup>4)</sup> The people who were facing risks after 3.11 are probably selecting the comments made by experts and deciding what is correct themselves, with such an attitude.

An expert must possess enough knowledge and confidence in his/her expertise. However, this confidence can become a misconception by making that one wrong move which propagates that only science and technology (specialized knowledge) can derive “correct” answers for people and the only necessity is to enlighten people about correct knowledge. In a situation where enough information regarding the current state or progress does not exist and distrust toward experts is increasing, for instance, the situation around the Fukushima Daiichi Nuclear Power Plant, it is not possible to alleviate the concerns of the people through thought-injection of knowledge alone.

## **II. Science and Technology Communication in the Post 3.11 Era**

### **1. Experts Who Respond to the Social Context**

It has been a long time since the interaction between experts and citizens began to be considered important, and terms such as “communication,” “dialog,” and “interactive” began to be used, not only in the field of nuclear energy but in the whole area of science and technology. Particularly in the field of nuclear energy, this tendency accelerated after the 1995 Monju accident and the 1999 JCO Nuclear Accident.

However, this communication always had “progress of science” as its main premise, and its focus has been on promoting people’s understanding about science (nuclear energy), despite claims to emphasize on interactivity, as is symbolized in some of the statements the author has discussed thus far. Experts do not grasp the situation of the society and do not understand what the society wants from science. Indeed, they are even lacking in the basic attitude of “listening to the voice of the society and learning from it”. In the statements issued by academic societies, critically discussed in this paper at least, such an attitude could not be felt.

One of the themes on which people with varying views on nuclear energy (pros and cons)

disagreed most strongly during the dialogs on nuclear energy that the author has been involved in was exactly this <sup>6)</sup>. While nuclear energy promoters proclaim that the importance of “development of society” or “pursuit of wealthy life” is self-evident, opponents and cautious people offer perspectives that “to begin with, changing the vision of a future that expects unlimited electricity and energy is necessary” and “instead of focusing on the growth model, we should rethink our understanding of wealth”. After 3.11, such views have suddenly become widespread in the society.

## 2. From PUS to PEST

In this sense, it is necessary to rethink the term “science communication,” which feels rather overused in the last 10 years.

The occasion when science communication, which had become an important trend since the end of Cold War particularly in Europe, faced an important turning point was what is now known as the “BSE Problem”. Even though experts in public positions stated that there is no harm to humans when the problem first emerged, the variant Creutzfeld–Jakob disease was discovered a few years later and human infection became a reality. This led to loss of trust in the government and experts in the UK. Following this, science communication in Europe, led by the UK, shifted from “public understanding of science (PUS),” which aimed at injecting knowledge into non-experts, to “public engagement in science and technology (PEST),” which shares the risk of science and technology, including their uncertainty, through dialogs and emphasizes on the participation of citizens in social decisions concerning the introduction of science and technology to the society and its regulation. To regain the lost trust in science and technology, they began aspiring to the “democratization model of specialization” that emphasizes the conclusion drawn by the common sense of non-experts instead of the model where experts enlighten the citizens.

Even in Japan, it has been brought to attention that after 1995, when many major accidents/incidents that shook the foundation of the society occurred (the Great Hanshin earthquake, the Tokyo subway sarin attack, and the Monju Accident), trust in experts also collapsed. Thereafter, the need for science and technology communication has also become important in Japan, and many activities have begun, as discussed earlier. However, science and technology communication in Japan tends to focus on positive aspects of science and technology such as their greatness or how fun they are. Furthermore, most public research and businesses in Japan tend to be one-sided and based on PUS, and it is undeniable that there was a deflection.

However, as it became obvious after 3.11, a promotion of the understanding of science and technology led by experts is not what is required of science and technology communication in the future. There are problems that we can question science with, but that science alone cannot answer. Methods of confronting such problems are known as problems of “trans-science.”

Various problems relating to low dose radiation exposure being faced in the Fukushima Prefecture pose questions such as how should experts provide information about scientific problems that no one knows the correct answer to? Or what is the right answer to problems that have a wide-range of solutions? How can society read such diverse information among diverse arguments with a certain degree of overview? And how can society derive any solutions? These are the urgent questions for the society now.

### 3. Transfer from Citizen Participation That Follows “Nuclear Energy First” to “Nuclear Power as a Choice”

Since March 11, the question “what is required of nuclear energy experts to regain the trust of the society” is often asked. Although it sounds too tough, the author believes that at least for now, the premise that “they cannot be trusted only by words alone” must be trusted.

Nevertheless, if nuclear energy experts still wish to be trusted, they must show a drastic change within themselves.

In Japan, since 2000, citizen participatory technology assessment (pTA) such as consensus conferences started to gain attention as ways to implement the aforementioned trans-science methods. It is an attempt to comprehensively evaluate the potentials and risks of science and technology through discussions among the members of public having diverse ages, professions, and senses of value when a new technology is being introduced to the society. In Europe, a framework to reflect its result on the real policy has been developed. In Japan, though the implementation and results are still relatively low, they are gradually increasing.

However, in the case of nuclear energy, the trying such an initiative was challenging. The main hurdle was that the position of the pro-nuclear camp whose premise is a society that uses nuclear technology as its infrastructure and the position of the anti-nuclear (prudent) camp that argues for zero nuclear energy as the starting point instead of taking it for granted do not meet at all, and it is impossible to even begin a discussion. This means that the fate of the subject of nuclear energy was that “upper assessment,” which is an evaluation to be conducted at the beginning of development and an important point of pTA, was not possible.

If nuclear experts wish to converse with the citizens in order to regain their trust, their side (including the policy-makers involved in nuclear energy) must change their perspective of taking the need for nuclear energy for granted to seeing nuclear energy as only an option, and undertake such initiatives in citizen participation. In other words, it is important for the nuclear experts to return to the drawing board and seriously consider the possibility and practicality of the “abandoning nuclear energy” scenario. Naturally, discussions remain to be had on whether the result of pTA should directly influence policies. There are also many issues in the system of pTA itself. In that sense, this is not a quick solution. However, irrespective of whether our society continues to use nuclear energy or abandons it, it is not a decision to be made in haste. Currently, the nationwide controversy of which type of energy source to select, including the process of social decision-making, is the most urgent discussion.

Furthermore, nuclear energy experts must have the determination to honestly accept the conclusion of such a discussion, even if it is to “abandon nuclear energy”. If that is not possible, the people’s trust in them will fade further, regardless of what they claim.

## III. Conclusions

In the last 10 years, the author has organized many events where people from all walks of life discuss the issue of nuclear energy at several places throughout Japan. The most important point at these events was for people with different opinions to converse instead of seeking direct resolution (whether to promote or oppose the construction of a nuclear facility at a given site).

After March 11, the author has a profound concern that this assertion has been too slow. Observing various miscommunications after the earthquake, she is often tormented by regret that she was too slow. However, she still believes that in order to decide how to handle nuclear

energy in the society, it is now especially important for people who have seen different “facts” after 3.11 to converse among themselves in order to try to bridge the gap between them, with the premise that “it should be decided gradually, and a direct conclusion should not be hurried.”

The author of this paper wrote in her book<sup>4)</sup> that “it is important for people like us who try to create the situation for discussions to be criticized by both the promoters and the opponents, and in a sense, it is meaningful to be recognized as a nuisance. Those who organize discussions must always be distant from every opinion, and at the same time be close to every opinion. In that sense, I believe it is the responsibility of the person who approaches such a problem to take every criticism to heart from the perspective of communication.” Upon concluding this paper, the author would like to reflect on this responsibility again and consider the importance of the criticisms she have received until now.

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