COMMUNICATION ACTIVITIES THROUGH DIALOGUE IN JAPANESE GEOLOGICAL DISPOSAL PROJECT OF HIGH-LEVEL RADIOACTIVE WASTE

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Abstract

The Nuclear Waste Management Organization of Japan (NUMO) was established in October 2000 based on the "Specified Radioactive Waste Final Disposal Act" as the authorized implementing entity approved by the Minister of Economy, Trade and Industry (METI).

Our mission is the "Realization of the Geological Disposal of Radioactive Waste". Since its establishment, NUMO has been engaging in communication and research and development (R&D) to fulfill the mission.

As a new initiative for enhancing the site selection process of geological disposal, Japanese government is now preparing for an announcement of the "Nationwide Map of Scientific Features for Geological Disposal", which categorizes all areas in Japan into four categories.

In such a situation, NUMO is working on raising awareness and enhancing understanding of the geological disposal project among the public. NUMO is also making efforts to listen to the opinions of the public on geological disposal to understand what the public concerns are.

NUMO has been carrying out PR activities such as advertising on TV commercials and newspapers to raise public awareness of geological disposal. We are currently focusing on face to face communication activities such as holding seminars with small group discussions and outdoor events with a communication vehicle, "Geo Mirai". Utilizing other measures including cross-media advertisement, opinion surveys and press releases allows us to reach out a wide range of stakeholders in Japan.

1. Introduction

NUMO was established as an implementing body of Japanese geological disposal project of high-level radioactive waste in October 2000 in accordance with the Specified Radioactive Waste Final Disposal Act.

In Japan, as part of an energy policy, spent fuel from nuclear power generation is reused by reprocessing. During this reprocessing process, high-level radioactive waste (HLW) is generated. NUMO's mission is to realize safe geological disposal of HLW. About 18,000 tons of spent fuel is stored in nuclear power plants now. If the reprocessing is implemented in full, about 25,000 vitrified wastes will be produced.

Since disposal of the wastes is necessary, NUMO has carried out communication activities to enhance the idea that "disposal of HLW is our own issue". Thus, it has been exchanging opinions with the public about the significance and safety of geological disposal. In July 2017, the government published the Nationwide map of Scientific Features for Geological Disposal (the map) which classifies all areas in Japan by scientific features. It provided an opportunity for NUMO to promote dialogue with the public throughout Japan.

2. Outline of NUMO's public relations activities

Since the establishment in 2000, NUMO has been engaging in PR activities to raise public awareness of geological disposal project through workshops and advertising on television commercials. In December 2002, open solicitation for literature survey started.

In January 2007, Toyo town in Kochi prefecture applied as a volunteer area. However, in April of the same year, it withdrew after the strong opposition from local residents. NUMO accepted this experience seriously and learned that many people have concerns about the safety of geological disposal of HLW. Under the recognition that confidence building in the public is essential, it started to develop more face-to-face dialogues in small groups.

When the Great East Japan Earthquake occurred, considering the associated nuclear accident at the Fukushima Daiichi Nuclear Power Plant, NUMO decided to refrain from public relations on its geological disposal project for the time being. NUMO reviewed its PR activities and restarted conveying information on geological disposal through good practices in other countries and exchanging opinions with the young generation and teachers.

In May 2015, the Basic Policy on the Final Disposal of Specified Radioactive Waste was revised by Japanese government. With the recognition that realization of geological disposal project is the benefit of whole society, it stipulated that the burden should not be transferred from the current generation to the next generation. In accordance with this revised policy, NUMO's various communication activities have been carried out to meet the needs of each generation.

3. Technical reliability and public relations

Due to the Fukushima Daiichi Nuclear Power Plant Accident, fear and distrust on nuclear energy increased among the public. At the same time, the situation surrounding geological disposal got worse.

Fig. 1 shows a fluctuation of the public opinion about geological disposal before and after the accident, indicating that the public trust in the experts and people engaging in nuclear power has decreased. As the situation called for serious consideration, NUMO refrained from any activities for the time being. And trust of geological disposal similarly decreased.

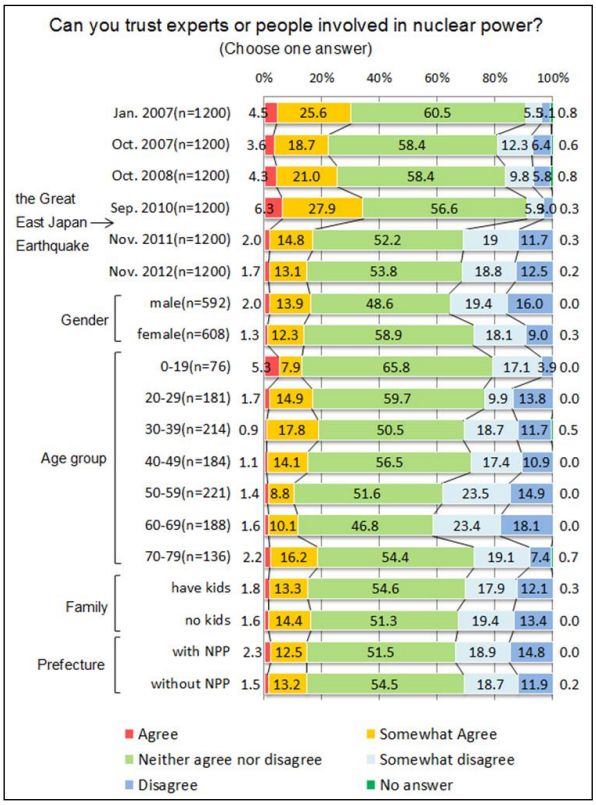

Fig. 1 Results of public opinion survey (2013), Japan Atomic Energy Relations Organization, http://www.jaero.or.jp/data/01jigyou/tyousakenkyu25.html, October 16, 2017

In symposia held for the past few years, participants had various questions or opinions including safety measures in geological disposal facilities and effects of volcanic and fault activities (see Fig. 2). To answer these questions, NUMO explains the international consensus that geological disposal is more realistic than other disposal methods because of its lower risk. Furthermore, some participants had comments on necessity of public relations for the young generation and a silent majority.

- Does digging a large tunnel have a negative effect on geological structure?
- What if a tunnel collapses during construction?
- According to the explanation, a repository will be constructed in coastal areas. Is there a possibility of Tsunami effects?
- I'm concerned that backfilling will cause the leak of radioactive materials.
- Can geological disposal methods maintain its safety in the future?
- NUMO explained geological disposal is reliable. But how can you prove the long-term stability of geological structure in the objective area?
- What measures will be taken to a possible serious accident after backfilling?
- How can you prove that the location of volcanoes and active faults will not change in the far future?
- Is geological disposal safe and reliable in a land of earthquake? Radioactive materials would leak in the long run.
- I want to know more about the engineered barrier system.
- Is it possible to simulate the future safety after 100,000 years or 1,000,000 years?
- I understood NUMO's efforts to ensure safety. In case of emergency, what measures will be taken?

Fig. 2 Frequent questions and opinions on geological disposal

In Japan, the feasibility of geological disposal was confirmed in 1999. R&D has been developed in the field of geological environment, cost-effective construction and safety assessment. Nevertheless, there are not enough opportunities to provide information of technical reliability, and some people have concerns about it. Taking this into account, NUMO explains safety and risk through dialogue.

On the other hand, dialogue often positively changed the participants' awareness or feelings about geological disposal. Once participants obtain some knowledge on it, their concerns will decrease. The details will however follow later, thus, dialogue will lead them to understand technical reliability.

4. Nationwide activities

In fiscal 2016, NUMO carried out dialogue in geological disposal seminars throughout Japan. Prior to the publication of the map, NUMO came to develop small group sessions to interact directly with participants.

In dialogue, NUMO made efforts to explain technical terms (e.g. reversibility and retrievability, half-life radioactive waste) in simple words. Besides this, in response to the participant's interest, topics of sessions cover geological disposal to nuclear fuel cycles. Questions from participants vary widely. For instance, some are about the difference between HLW and contaminated waste by radioactive materials. Other questions are about the Fukushima Daiichi Nuclear Power Plant accident, Mixed Oxide Fuel, etc. At events, NUMO staff expresses gratitude by taking care of each participant through greeting and guiding with courtesy.

Surveys were carried out before and after the each seminar to see the satisfaction level of participants. The results revealed that changes in the level of understanding and satisfaction of participants improved after seminars (see Table 1). Such positive feedback is thought to be because of NUMO staff's attitude to listen to their opinions. Although those efforts are not on the questionnaire, NUMO's honest and sincere attitude and face-to-face dialogue contributed to the evaluation (see Table 2).

Both communication and technical staff have been striving to improve their communication skills through study meeting within the organization and dialogue trainings by outside experts, believing that honesty and sincerity is the key to the fruitful two-way communication.

Table 1 The results of surveys in geological disposal seminars in 2016

(N=483)

Question	Option	Before (%)	After (%)
Geological disposal is the most reliable method to dispose of HLW.	Agree	13	19
	Somewhat agree	23	34
	Neither agree nor disagree	18	14
	Somewhat disagree	5	4
	Disagree	16	13
	I don't know	18	6
	No answer	7	10
		36 → +17	53
There are geologically preferable areas in Japan.	Agree	11	15
	Somewhat agree	13	20
	Neither agree nor disagree	18	20
	Somewhat disagree	8	6
	Disagree	24	20
	I don't know	18	10
	No answer	8	9
		24 → +11	35
Geological disposal can be carried out safely.	Agree	9	13
	Somewhat agree	16	24
	Neither agree nor disagree	22	22
	Somewhat disagree	8	6
	Disagree	23	20
	I don't know	14	5
	No answer	8	10
		25 → +12	37
I agree with carrying out geological disposal.	Agree	15	21
	Somewhat agree	16	27
	Neither agree nor disagree	22	17
	Somewhat disagree	5	4
	Disagree	20	17
	I don't know	14	4
	No answer	8	10
		31 → +17	48

Table 2 The results of surveys in geological disposal seminars in 2016

(N=483)

Question	Option	Answer(%)
Explanation from NUMO was easy to understand.	Agree	29
	Somewhat agree	36 → 65
	Neither agree nor disagree	10
	Somewhat disagree	2
	Disagree	2
	No answer	21
I was satisfied with the explanation.	Agree	22
	Somewhat agree	32 → 54
	Neither agree nor disagree	14
	Somewhat disagree	5
	Disagree	6
	No answer	21
NUMO was sincere.	Agree	45
	Somewhat agree	24 → 69
	Neither agree nor disagree	5
	Somewhat disagree	2
	Disagree	1
	No answer	23
I felt close to NUMO.	Agree	27
	Somewhat agree	29 → 56
	Neither agree nor disagree	16
	Somewhat disagree	2
	Disagree	4
	No answer	22

5. Dialogue through various channels

5.1 Online information dissemination and opinion exchange

5.1.1 NUMO's official website

NUMO operates its website as an important tool to disseminate information widely. Fig. 3 illustrates increase and decrease of current page views. According to that, page views increased considerably in August 2016, which is considered as an achievement of newly set up pages on summer science assignments for kids.

Furthermore, this March, the contents and layout of the FAQs were renewed to pursue more user-friendly website. Technical information was revised to use more simple words in collaboration with communication and technical staff. As a result, these efforts have increased page views. Further, due to the publication of the map, page views got twice or three times as many as ever before.

5.1.2 E-mail magazine

E-mail magazines have been issued twice a month on average since February 2015. This is aimed to not only provide information timely, but also have people feel closer to NUMO. One of the efforts on the column named "NUMO *no hito*", employees alternately introduce hobbies or what they consider important in their job or even in private life.

These E-mail magazines have been sent to more than 7,000 addresses in total until September 2017. Staff encourages participants to register for the e-mail magazine at the each event by NUMO.

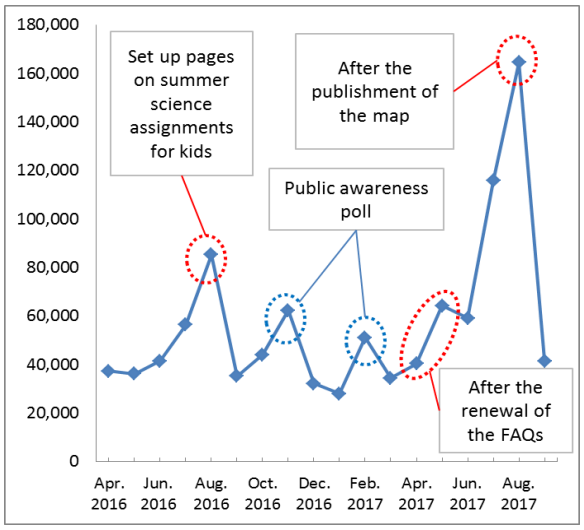

Fig. 3 Increase and decrease of page views of its website

5.1.3 Official account on Facebook

NUMO opened its official account to enhance more understanding of geological disposal, especially among women and the young generation in April 2015. Facebook has enabled more people to learn about NUMO's activities easily and share the information with other users, even if they never had a chance to visit NUMO's website or participate in any of symposia. Not only those but also photos of events and articles in more simple words enabled people to feel closer to NUMO. The frequency of update is usually once or twice a week.

Fig. 4 illustrates increase and decrease of "Like" on Facebook, which have been collected since NUMO launched its account. In the beginning, April 2015, the number of "Like" was 172. "Like" and comments have grown in number. As of the end of this September, the number of "Like" reached 17,639.

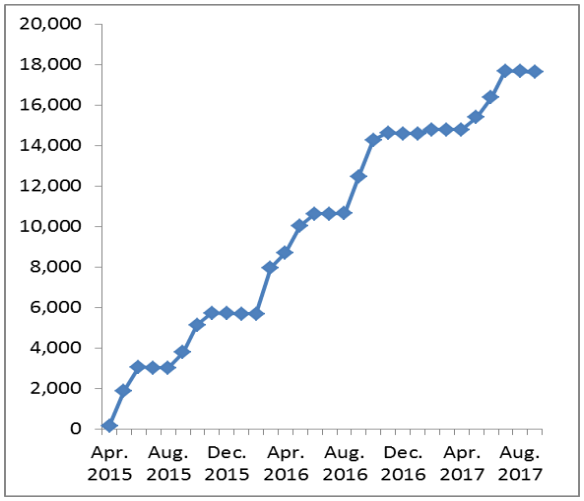

Fig. 4 Increase and decrease of "Like" on Facebook since the launch in April 2015

Furthermore, this autumn, NUMO launched Instagram account, which is expected to raise awareness among women and the younger generation for geological disposal.

5.2 Media relations

As public relations for the media, NUMO has been working on responding to inquiries, interviews to board members; carrying out site visits of the underground research laboratory of JAEA; composing and distributing press releases; lectures on geological disposal for the press, and interviews at symposia.

However online news and social networking services are recently getting popular and postings by data journalists are growing, it is no exaggeration to say that the media still has a great influence and the public trust. In response to this situation, it is very important to enhance the media's interest in and promote coverage of geological disposal so that it expands understanding among the public.

Newspapers and TV stations have their own characteristics such as their circulation areas (national or local), strong points, and their own creeds for news coverage as media organizations. But it is not impossible to understand different stances on geological disposal or nuclear power by analyses of articles and newspapers. For instance, an analysis on the map confirmed that the each stance on the map is similar to those on the restart of nuclear power plants. One of the well-known newspapers in Japan, the Asahi Shimbun is said to be critical of nuclear power generation. On the other hand, the Yomiuri Shimbun seems to be affirmative on it.

The map caught the attention of the media. All the nationwide TV stations covered it on the news. Regarding the number of articles in newspapers, more than 50 newspapers (national and local) covered it. Since the local media takes an important role to enhance understanding across the country, NUMO exchanges opinion with and provide information to editorial writers to increase their interests on geological disposal. In order to get a lot of media exposure of NUMO's nationwide dialogue, it is effective to provide information to the local media through distribution of press releases in person to increase their interests on geological disposal.

At events held by NUMO, reporters strictly obey the coverage policy set up by the organizer because participants' privacy should be thoroughly taken care of. A steady effort will contribute to build public confidence.

5.3 Activities for the next generation

Other than the activities referred above, NUMO is developing various activities such as international seminars, events using the communication vehicle, cross-media marketing, etc. Especially, regarding international seminars, public interests in advanced cases in other countries such as Finland or Sweden are high. Themes of the seminars cover various fields including consensus-building, plans for living together in regional areas, etc.

Nationwide surveys using internet revealed that awareness of geological disposal among males is higher than the one among females. The surveys mentioned above also proved that there is room for improvement in raising awareness among the young generation. Accordingly, NUMO is proactively carrying out various activities to adopt geological disposal to education, for example, dispatch of NUMO staff to lectures for both students and school teachers or making supplementary teaching materials.

As part of activities for the young generation, in July 2017 Tokyo, NUMO collaborated with university students in an advertising competition for student groups called "Adfes" to set geological disposal as a theme of this year. 14 advertising societies of Japanese universities competed with each other with various plans to spread the idea that geological disposal of HLW is our own issue among the public. NUMO supported to offer them with the opportunity to join its symposia, site visits and lectures. The winner's plan "Geological disposal in the size of *Tenohira*" focused on the battery of smartphones since it is a familiar energy usage in our daily lives. In the plan, mobile batteries are distributed and collected. Users take messages when they get it or throw away to the box after using it as batteries and boxes are set with digital signage. This competition was covered in 52 online columns and 3 newspapers and NUMO is considering practical use of the winner's proposal.

6. Conclusion

The purpose of the map publication in July 2017 is to show those geological characteristics across the country in terms of volcanos, active faults, mineral resources, waste transportation, etc. Not only NUMO but also electric power companies set up customer services as the producer of waste, and NUMO will continue nationwide communication activities in close collaboration with them.

In NUMO, inquiries from the public are increasing after the publication of the map, which shows that awareness of geological disposal is raising gradually. The map publication doesn't decide a site without municipalities' permission. In the years ahead, dialogues will be ongoing mainly in more geologically assumed preferable areas in terms of safe waste transportation "green and coastal area" on the map, and face to face communication will be truly essential.

It comes to the conclusion that listening to opinions is greatly important no matter they are positive or negative about nuclear power generation in order to mitigate their concerns.