Research on the status and problems of information disclosure in the field of nuclear safety in China

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Abstract. Public concern about nuclear safety reached an unprecedented level after the Fukushima accident in Japan. Although the existing laws and regulations in the field of nuclear safety in China regulate the information disclosure to a certain extent, compared with other advanced nuclear countries, there are still some problems such as the imperfect legal system and the insufficient operability of information disclosure methods. The information disclosure system and mechanism of the United States, France, and the United Kingdom were studied, and solutions to problems were proposed to provide reference for improving the information disclosure mechanism in China's nuclear safety field.

1. Introduction
Information disclosure is an inevitable trend in today's social development stage, and has became an important and urgent bottleneck problem of nuclear safety. In the wake of the Fukushima accident in Japan, public attention on nuclear safety has reached unprecedented heights. "Transparent" is an important source of safety, and safety requires "transparent". International practical experience shows that the disclosure of nuclear safety information will not reduce public confidence in nuclear safety, but will improve public trust in government. China has formed a relatively complete environmental information disclosure system. However, in the field of nuclear safety, compared with advanced nuclear countries such as the United States and France, there still exist problems such as the imperfect legal system and lack of operability of information disclosure policy.

2. Foreign status

2.1. France
France's public understanding for nuclear energy is better than other countries. This is because France is a nuclear-holding country, so there is little resistance to the use of civilian nuclear technology. Secondly, France is a poor country in resources and has formed an consensus that nuclear energy is indispensable from the perspective of energy independence.

The Nuclear Information Transparency and Nuclear Safety Act, enacted in June 2006, strengthens the role of the French Nuclear Safety Authority (ASN), stipulates the need to disclose basic information to the public about nuclear energy, the nuclear facilities, the risks and protective methods of radioactive waste transport. The Nuclear Information Transparency and Nuclear Safety Act...
stipulates that the responsibility of the government is (1) to provide the public with the monitoring methods and results on nuclear safety and radiation protection (2) to disclose to the public the relevant information about the impact of foreign nuclear facilities in the event of nuclear incidents and accidents [1].

French government agencies, power companies, and nuclear energy-related agencies are actively engaged in information disclosure and public relations activities related to nuclear energy. Since 1987, the French Nuclear Safety Administration (ASN) has used telephones to conduct information disclosure activities such as the operation conditions of nuclear facilities. Since 1989, ASN has published the accidents of nuclear power plants based on own evaluation standard (in 1994, it was changed to the international evaluation standard of IAEA). In addition, the power company also launched advertising campaigns through exhibitions, publications, networks, newspapers, televisions, etc.

The information disclosure activities of the district where nuclear facilities are located is implemented by the Local Information Committee (CLI). The CLI was set up in December 1981 according to the prime minister's orders. CLI is responsible for communicating the results of environmental impact assessments and the information received from the operating organization of nuclear facilities to the residents. The role and obligations of CLI are clearly defined in the Nuclear Information Transparency and Nuclear Safety Act of June 2006. The CLI is composed of members of the city, county, village and district councils, representatives of environmental groups, representatives of the economic community, trade unions, medical institutions, and disaster prevention experts. It holds two regular meetings a year to exchange information about experience and activities. The safety supervision department and other relevant government departments, and the operating organization of nuclear facilities may also attend the meeting as an observer. People can obtain general information about nuclear energy safety and radiation protection through CLI. In addition, the objective and comprehensive assessments of the environmental impact are implemented by experts, and disclose these information to the residents in an easy-to-understand method, CLI plays a positive role in ensuring information transparency and promoting general public understanding [2].

In addition, as "the public's right to know", the relevant act protects the public's right to obtain information about radiation risks and how to avoid radiation risks from the operating organization of nuclear facilities.

2.2. United States

On the official website of NRC in the United States, public information is classified and aggregated in the NRC library database, and the public can inquire about information as needed. The environmental information of nuclear facilities mainly includes radioactive effluent emission report, environmental radiation monitoring report, operation event report of nuclear facilities, major emergency information, various environmental documents (environmental impact assessment report, environmental impact statement) in the process of licensing review, etc. At the same time, U.S. federal regulation 10CFR51 also stipulates that after receiving the applicant's environmental impact assessment report, the NRC shall prepare the environmental impact statement for the application content submitted by the applicant, and the NRC needs to conduct public opinion survey when preparing the environmental impact statement.

Environmental impact assessment reports for various licensing applications of nuclear power plant and the environmental impact statements of NRC will be published to the public through various channels after the completion of public participation steps. The public can understand the analysis results of various environmental problems and the specific assessment opinions of the NRC.

In response to emergencies, especially after the Fukushima nuclear accident, the NRC responded to public questions in a timely manner, promptly announced the results of safety inspections, and timely stated the government's position on the safety of nuclear power plants of United States.
2.3. Britain
After the Chernobyl accident, Britain took a negative stand on the new nuclear power plant. But because of the depletion of the North Sea oil field and the global warming, nuclear energy development once again entered the Britain government's vision. Britain began to actively promote the nuclear energy policy after the nuclear energy white paper was published in January 2008.

Britain's nuclear energy propaganda, (1) adopting an objective propaganda method, not only propagating the favorable aspects of nuclear energy, but also clearly expressing the problems (2) making regular news reports in the community, whether it is good or bad.

The electric power company, the British Nuclear Industry Forum (BNIF) and the Regional Liaison Council (representative organizations of district residents) hold regular meetings to exchange information about experience and activities. The members of the Regional Liaison Council are composed of police, farmers, fishermen, educators, councillor and so on. Information is communicated to residents promptly by the responsible person of the nuclear facilities in the community, whether it is good or bad.

In addition, in terms of geological disposal of radioactive waste, from 2009 to 2010, West Cumbria Managing Radioactive Waste Safely Partnership (MRWS) sent brochures for site selection of geological disposal of high-level radioactive waste to all households in the state of Ala Santander and Copland. At the same time, hearings were held to provide information to the public about site selection and the organization's participation in the site selection process. The methods like posters and meetings were also adopted for information disclosure. The MRWS is an advisory body for the purpose of providing advice to the city councils, it consists of the National Agricultural Union (NFU), local trade unions and stakeholder groups, etc.

3. Status of nuclear safety information disclosure in China
Since 1991, the National Nuclear Safety Administration has published the National Nuclear Safety Administration annual report, which is convenient to relevant departments, the public, and the domestic and foreign counterparts to understand the status of nuclear safety regulation of China. And this is an important channel for the disclosure of nuclear safety information. In 2010, in conjunction with the operation accident of the Daya Bay nuclear power plant, the National Nuclear Safety Administration tried to establish a disclosure mechanism of nuclear safety information. In April 2011, the National Nuclear Safety Administration issued an information disclosure plan of nuclear safety regulatory (for trial implementation). This plan clearly stipulates the organizational system, division of responsibilities, content, and methods of nuclear safety information disclosure, and requires local environmental protection departments to prepare their own disclosure programs of nuclear safety regulatory information. In 2012, the National Nuclear Safety Administration issued the "Nuclear and Radiation Safety Information Disclosure Procedures" and other documents to continuously improve the information disclosure system.

Taking the Fukushima nuclear accident as an opportunity, the information disclosure of nuclear safety has made breakthrough progress. In March 12, 2011, the website of the National Nuclear Safety Administration set up an emergency column for Fukushima nuclear accident. At present, the monitoring data of radiation environmental quality of the National Nuclear Safety Administration is regarded as authoritative data in China. Through the network, the automatic monitoring data of ambient air absorbed dose rate around nuclear power plants are disclosed daily, so as to eliminate public anxiety and ensure social stability.

The Nuclear Safety Law promulgated on September 1, 2017 stipulates relevant content of information disclosure. Article 63 of the Nuclear Safety Law stipulates that“The relevant departments of the State Council and the departments designated by the governments of provinces, autonomous regions and municipalities directly under the Central Government where nuclear facilities are located
shall open the relevant nuclear safety information in accordance with the law within the scope of their respective functions and duties.

The nuclear safety regulatory department of the State Council shall make public the administrative licensing in relation to nuclear safety and information on the regulatory safety inspection reports of nuclear safety related activities, the overall safety situations and the quality of radiation environment as well as nuclear accidents in accordance with the law.”

Article 64 of the Nuclear Safety Law stipulates that “The operating organization of nuclear facilities shall publicize information on their nuclear safety management system and related documents, safety status of nuclear facilities, radiation monitoring data of effluent and surrounding environment and annual nuclear safety reports. The specific provisions shall be formulated by the nuclear safety regulatory department of the State Council.

4. Comparison and Analysis
Despite the rapid development of information disclosure in the field of nuclear safety, there is still a big gap between China and the advanced nuclear countries in the world, such as:

(1) The regulatory system still lacks operability
Although the Nuclear Safety Law stipulates the subject and responsibility of information disclosure in the field of nuclear safety, it is only principle stipulation. There is still a lack of operability in dealing with issues such as what to disclose, how to disclose it, etc. On the other hand, other published documents on disclosure of nuclear safety information are low-level, causing public doubts about obtaining nuclear safety information [3].

(2) The range of information disclosure is not enough
Environmental information disclosure of nuclear power plants such as the United States and France has formed a institution. Annual radioactive effluent emission reports and annual environmental radiation monitoring reports of nuclear power plants are published in accordance with regulations, and the public can get various kinds of relevant details. In China, although the absorbed dose rate in air around the nuclear power plants have been published on the website of the National Nuclear Safety Administration, the radioactive monitoring results of liquid effluents from nuclear power plants and surface water, drinking water, groundwater, fish, sediments and so on that the public may pay more attention to are still not be disclosed to the public now.

(3) The level of detail of information disclosure is insufficient
The environmental reports of various nuclear power projects in the United States for various license applications and the environmental impact submissions given by the NRC after the environmental review are publicly released. The public can understand the analysis results of various environmental problems and the specific evaluation opinions of the NRC. In China, only a few pages of the environmental impact assessment reports of the nuclear power plants can be retrieved at most on website.

5. Discussion
In this background, to solve the above-mentioned problems and promote the disclosure of information in the field of nuclear safety in China, the solution is:

(1) Improve the legal system.
The National Nuclear Safety Administration of China should increase the research on information disclosure of nuclear safety, speed up the legislative work at the level of department regulations, make more detailed and stricter regulations on information disclosure in the process of environmental impact assessment of nuclear facilities projects, and improve the regulatory system of nuclear safety in China [4].

(2) Strengthen information disclosure.
The National Nuclear Safety Administration of China should attach great importance to the work of information disclosure, formulate the plan for information disclosure of nuclear safety supervision, build an open and transparent information exchange platform, and clarify the scope of responsibility
and procedures for information release by government departments and the operating organization of nuclear facilities.

(3) Constantly improve the public opinion response mechanism.

The National Nuclear Safety Administration of China should establish a special public opinion monitoring and response team, and should improve the internal information database and public opinion reporting system of the government and the operating organization of nuclear facilities, upgrade the means and system platform of network public opinion monitoring, carry out real-time public opinion network monitoring, timely release authoritative information, and form a correct public opinion orientation.

(4) Strengthen the science popularization education of nuclear safety.

The National Nuclear Safety Administration of China should attach great importance to the propaganda of nuclear safety, make full use of various media, and actively coordinate with relevant departments to increase the popular science knowledge of nuclear safety in basic education. Should carry out expert interviews, science lectures and other popular science activities timely, publicize various kinds of nuclear safety knowledge vigorously, let the people form a correct understanding of nuclear safety.

6. Conclusion

With the continuous acceleration and unprecedented development of China's nuclear industry, the issue of nuclear safety has become increasingly prominent. The nuclear safety issues have gradually become the focus of public concern. Opening information to the public, ensuring information transparency and promoting general public understanding can avoid or reduce subsequent conflicts, and also meet the requirements of achieving a harmonious society. Therefore, the primary task now is to aim at the weak links of information disclosure, strengthen legislation in the field of nuclear safety, solve the problems such as the lack of operability of information disclosure policy, effectively protect the public's right to know.

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