



Discussion on the Reporting of Nuclear Safety Incident from the Perspective of Media Ecology

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Abstract. Nuclear safety events report is an important part of news reports related to nuclear power. Correct and appropriate reporting is very important for the positive development of public opinion and the emotional guidance of the public in China, and it also directly reflects the overall level of China's nuclear safety culture construction. Based on the media ecology, this paper studies the evolution of the concept and way of accident reporting in China, and taking the recent report of Taishan nuclear power incident in 2021 as an example, discusses the differences and changes in several public opinions in the brand-new media ecology mode, such as the report way, the report idea and narrative subject, and puts forward a new perspective and thinking, and holds that we should seek truth from facts, be scientific and rigorous, use appropriate reporting and public communication methods, and take advantage of news language and different narrative subjects to make the real situation. I hope the new perspective of this paper can provide reference for future related work, and maintain the healthy and upward development of our nuclear safety culture atmosphere.

Keywords: Nuclear Power · Report · Event · Accident · Media · Ecology · Digital New Media · People Oriented

1 Introduction

Media ecology view [1] is the news cognition and rational thinking made by contemporary media ecology in order to establish the harmonious relationship among people, media and society system and realize the virtuous circle of media ecosystem under the condition of market economy. Aiming at the report of “nuclear safety Event” in nuclear power industry, it is of great significance and function to learn the correct concept of media ecology and establish the report concept and direction under the brand-new mode of joint reporting by mainstream media (including TV stations, radio, newspapers and magazines, etc.) and self-(new) media after 2008, so as to meet the test of market economy, launch all-round competition with western media giants, resolve the public opinion crisis and establish a good nuclear safety culture atmosphere of sustainable development in.

2 Relationship Between Nuclear Safety-Related Events (Accident) and Other Events (Accident)

2.1 Nuclear Safety Incident/Accident

Nuclear power plants and all facilities related to the civil nuclear industry, transportation of materials in radioactivity and any incidents related to materials (or radiation) in radioactivity are classified into seven levels: the higher Grade (4–7 levels) is classified as an “accident”; The lower Grade (grade 1–3) is “event”. Events that do not have safety significance are classified as zero level and designated as “deviation”. Incidents not related to security are classified as “off-Classification” (Fig. 1).

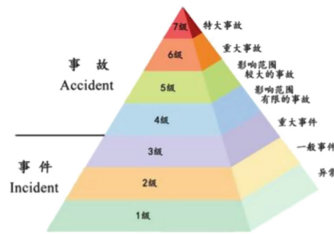


Fig. 1. Classification of accidents and incidents

In the operation of civil nuclear power plants in China, there was a Class 1 incident (abnormal, the operation of nuclear power plants deviated from the specified functional scope), but this Grade had no impact on the outside, only the internal operation violated safety standards, or minor problems that might involve safe operation occurred). The rest are Class 0 events (deviation will not affect the nuclear safety of nuclear power plants). There are only two major accidents of Grade 7 (radioactivity materials released by nuclear power plants outside the plant, resulting in extensive health and environmental impacts) in history, namely Chernobyl nuclear accident in 1986 and Fukushima Daiichi nuclear power plant nuclear leakage accident in 2011.

The international atomic energy agencies require member states to promptly rate nuclear incidents of Level 2 and above and those that cause media and public concern and notify the international atomic energy agencies within 24 h [4].

2.2 Safety Incidents (Accidents)

Safety accidents refer to accidents that suddenly occur in production and business operations (including activities related to production and business operations), harm personal safety and health, damage equipment and facilities, or cause economic losses, resulting in temporary suspension or permanent termination of original production and business operations (including activities related to production and business operations). According to the Regulations of the People’s Republic of China on Reporting, Investigation and Handling of Production Safety Accidents promulgated by State Administration of Work Safety Decree No.13 in July 2007, accidents are generally divided into the following Class according to casualties or direct economic losses:

- (1) Special Major Accident refers to accidents that cause more than 30 deaths, or more than 100 serious injuries (including acute industrial poisoning, the same below), or direct economic losses of more than 100 million yuan;
- (2) Major Accident refers to accidents that cause more than 10 deaths and less than 30 deaths, or more than 50 serious injuries and less than 100 serious injuries, or direct economic losses of more than 50 million yuan and less than 100 million yuan;
- (3) Major accidents refer to accidents that cause more than 3 deaths and less than 10 deaths, or more than 10 serious injuries and less than 50 serious injuries, or direct economic losses of more than 10 million yuan and less than 50 million yuan;
- (4) General accidents refer to accidents that cause less than 3 deaths, or serious injuries to less than 10 people, or direct economic losses of less than 10 million yuan.

According to the Opinions of the Office of the Security Committee of the State Council on Strengthening the Information Disclosure of Production Safety Accidents issued in 2012, all regions and relevant departments are required to inform the public of the information on the response and disposal of production safety accidents in a more comprehensive, timely and detailed manner in accordance with the requirements of “active disclosure”. First, it is necessary to timely and accurately release the information of production safety accidents, especially accidents with great social impact and high attention, so as to eliminate the space for false rumors and suspicions to spread. Second, it is necessary to timely and accurately release the accident handling measures taken by the government and the progress information of emergency rescue, grasp the trend of social public opinion in real time, actively respond to social concerns, and eliminate public doubts. And promote the investigation and accountability of production safety accidents and information disclosure, and take the initiative to accept social supervision.

2.3 Public Emergencies and Disasters

Public emergencies [5] generally refer to “public emergencies involving public safety that occur suddenly, pose or may pose major threats and damages to national security and legal system, social security and public order, citizens’ lives and property safety in the whole country or some areas, and cause huge casualties, property losses and social impacts. For example, SARS in 2003 and COVID-19 in 2019.

Disaster refers to the phenomenon that great productivity and means of production are destroyed to human society due to sudden natural disasters and disasters. Such as Wenchuan earthquake in 2003.

2.4 Potential Relationship Between Incidents (Accidents)

Nuclear safety incidents (accidents) have many similarities with “accidents”, public emergencies and disasters, all of which are sudden and urgent, which lead to rapid changes in the social environment. The response to the regulatory authorities also requires urgency, and the consequences are highly uncertain in the short term, that is, the environmental changes cannot be accurately judged at the beginning of the events, which may have a huge impact on society, that is, it has a serious impact on the normal ecology and code of conduct of the social system, and even threatens the harmony and security

of the country. In addition to the above characteristics, nuclear accidents have their own particularities: Firstly, the diffusion is relatively concentrated, and radioactivity materials are mainly concentrated in the location of nuclear power plants and surrounding areas, so there will be no similar epidemic spread in a wide area, but the early warning time is short, and the early warning time of Validity is usually only a few hours, and the nuclear accident process is fast and the impact is lasting. Radioactive element's half-life is very long, and some radioactive element and half-life even last for tens of thousands of years; Radiation damage to human health is difficult to detect in a short time, long-term and hereditary, and its medical effect is very limited. These characteristics are also the root cause of the widespread and high attention of the society and the public to the nuclear safety accident, even the "nuclear safety", and it is easy to cause rejection and fear emotionally!

3 Media Ecology and Characteristics of Accident Reports in China

3.1 Media Ecology

Media ecology refers to a science that explores and reveals the relationship between man, media, society and nature, and the essence and law of development and change with ecological viewpoints and methods [1]. Media ecology refers to a subsystem of social ecosystem, which emphasizes the interaction between media system and social system. Under the mutual checks and balances, the internal and external ecological environment of the media promotes the development of the media and promotes the virtuous circle of the media itself. The development of China's media ecology has gone through three stages: politicization stage, marketization stage and digitalization stage [2].

The following data [6] cannot be ignored: According to the 48th Statistical Report on Internet Development in China, as of June 2021, the number of Internet users in China reached 1.011 billion, and the Internet penetration rate reached 71.6%; As of June 2021, the number of mobile Internet users in China reached 1.007 billion; The number of online video (including short video) users in China reached 944 million; The number of online payment users in China reached 872 million; The number of online news users in China has reached 760 million; The Internet penetration rate reached 71.6%, exceeding the global average (65.6% 21) by 6 percentage points. One billion users access the Internet, forming the largest and vibrant digital society in the world.

3.2 Evolution of the Concept of Accident Reporting

It is an important part of news report and an object of great news value. Since the founding of the People's Republic of China, most scholars take 1978 and 2003 as the demarcation points, and divide accident reports into several stages. Before 1978, the reporting mode emphasized "the government's care and guidance" and pursued strong political propaganda, while relatively ignoring the relevant information of the accident itself, especially the human factors and consequences. From 1978 to 2003, when SARS happened, news reports gradually involved the information level of the event

itself, and changed from political weight to “matter-based”. The national level gave correct guidance, but some local governments treated news reports conservatively or even controlled when it involved local interests. After 2003, the news reports of events (accidents) repeatedly broke the forbidden zone, and constantly pursued the accuracy and transparency of information. Especially after the Wenchuan earthquake in 2008, the main channels of reporting gradually formed a brand-new mode of joint reporting by mainstream media and self-media from the original mainstream media (including TV stations, radio, newspapers and magazines, etc.), so the media also pursued the attention of participants (including witnesses, witnesses, victims, investigators, responsible persons, etc.) besides the events themselves, and the event reports changed from “event-based” to “people-based”. Although there are many problems at this stage, such as over-reporting, ethical disputes, lack of news literacy of new media and so on. However, with the rapid development of Internet technology, the public’s demand for information under the new situation of unprecedented diversification of communication subjects and contents, and has a series of social impacts.

Several stages of accident reporting are corresponding, closely related and closely related to several stages of media ecological development. Establishing a correct concept of media ecology is of great significance and function for meeting the test of market economy, launching all-round competition with western media giants, resolving news crisis and establishing a harmonious society with sustainable development.

3.3 Reporting Basis and Present Situation of Nuclear Safety Event

The report of nuclear safety incident in China was officially released in October 2017 according to the Nuclear Safety Law of the People’s Republic of China. The fifth chapter, “Information Disclosure and Public Participation”, clarifies that relevant departments should disclose nuclear safety-related information to the competent or regulatory authorities, the society and the public, and there is Article 65, “nuclear safety in that is disclosed according to law should be disclosed to the public in a timely manner through government announcements, websites and other ways that are convenient for the public to know.” This provision clarifies the legality of reprinting and interpreting by new media such as “websites and other ways that are access for the public to know”. In addition, it also stipulates that “citizens, legal persons and other organizations shall not fabricate or disseminate false information about nuclear safety rights.”

In June 1995, National Nuclear Safety Administration promulgated the Reporting System for Nuclear Power Plant Operating Units (HAF001/02/01), which clarified the relevant guidelines and format requirements for nuclear power plant operating units to report National Nuclear Safety Administration incidents and operational incident reports to the, as well as the requirements for periodic reports, important activity notices and nuclear accident emergency reports. Through years of practice, in order to improve the shortcomings in the implementation process. To further implement the relevant requirements of the Law, the Nuclear Power Safety Supervision Department organized and formed the Regulations on Reporting Nuclear nuclear safety of Nuclear Power Plant Operating Units, which was reviewed and approved by the Ministry of Ecology and Environment on November 5, 2020 and implemented on January 1, 2021. There are seven chapters and thirty-four clauses, which mainly specify the reporting requirements

such as periodic report, important activity report, construction phase incident report, operation phase incident report and nuclear accident emergency report. The reporting criteria for operational events have been expanded from the original 9 to 12, which makes it clear that events such as shutdown, exceeding safety limits or safety system setting values, violating operation limits and conditions, serious deterioration of main physical barriers, and real threats to the safety of nuclear power plants should be reported as operational events, and relevant provisions on common cause events, cyber attacks and fraud events have been added.

It can be seen here that the regulatory authorities have been improving the reporting requirements of various incidents and accidents, and realism, objectivity and openness have always been their basic attitude and starting point. At present, the report of civil nuclear safety related events is basically the mode of official notification and media report, and the content of the report is basically the event itself and related concepts. Different media reports are basically reprinted, and there is no difference.

4 Examples of Nuclear Safety Incident Reports

In this paper, the report of an operation event of Taishan Nuclear Power Plant in 2021 and related public opinion are taken as cases for discussion.

April 9, 2021 National Nuclear Safety Administration website news: "At 13:58:14 on April 5, 2021, the radioactivity of dose of chimney gas dropped below the alarm threshold of high 1, and the incident ended. During the whole event, the unit is in a stable state and there is no other abnormality. After the incident, the operating unit carried out inspection and Validation, and preliminarily analyzed that the alarm reason was that after the initial water seal was filled with water, a small amount of radioactivity gas unexpectedly entered the water seal pipeline, and during the re-water seal filling process, the gas remaining in the water seal pipeline was discharged to the chimney through the ventilation pipeline; After calculation, the total amount of inert gas emitted in radioactivity this time accounts for 0.00044% of the annual emission limit. According to Article 22 (9) radioactivity and radiation exposure events in "of nuclear safety Reporting Regulations for Operating Units of Nuclear Power Plants, this event is defined as a Class 0 operation event."

On June 13, CNN reported that the US government was evaluating a report last week about the "leakage incident" of Taishan nuclear power plant in China. He said that before that, China's security department was raising the acceptable limit of radiation detection outside the plant to avoid the fate of nuclear power plants facing closure. French Famatong Company, which participated in the operation of Taishan Nuclear Power Plant in Guangdong Province, contacted the US government and asked the US for technical support to correct the problem, "warning" that an "imminent nuclear radiation threat" was about to occur in China. After CNN hype, keywords such as "nuclear radiation" and "leakage" appeared on the Internet very quickly, and the first round of public opinion aroused public concern.

On June 13th, CGNPC announced that the surrounding environmental indicators of Taishan Nuclear Power Station were normal. On June 16, the relevant person in charge of the Ministry of Ecology and Environment (National Nuclear Safety Administration) responded to the situation of Taishan Nuclear Power Plant in detail by asking questions at

a press conference, saying that the radioactivity level radioactivity of the primary circuit of Unit 1 of the nuclear power plant has been monitored at present, but it is still within the scope of allowing stable operation, and the operation safety of the nuclear power plant is guaranteed, and stressed that this is “completely different from radioactivity leaking radioactivity”. On the same day, the International atomic energy Agency (IAEA) indicated that it had received the latest information provided by the Chinese National atomic energy Agency on the above issues. Zhongqian Nuclear Power Plant is in normal condition, safe and secure operation, and there is no concern about radioactivity leakage or environmental pollution. The IAEA said it would continue to maintain communication with Chinese national atomic energy institutions. Global Times, the mainstream media, published an article on June 15th: “CNN refreshes the lower limit again! This time, they came to spread rumors about Taishan Nuclear Power Plant in Guangdong, China.” Reviewed and clarified the relevant facts in detail. It is pointed out that “CNN is writing according to the potential risks of Class like Fukushima nuclear accident”; The United States’ own restrictions on nuclear technology exports laid the groundwork for this hype. In August 2019, CGN and its affiliated enterprises were listed by the United States as “entities” in export control (Famatong needs to apply to the United States for exemption if it wants to apply American technology to Taishan Nuclear Power Plant), so Famatong contacted the United States to seek exemption for technology sharing. Of course, the United States finally decided that the situation at Taishan nuclear power plant was not critical, and rejected Famatong’s application to maintain export control to CGN.

Less than a month later, there was a second round of public opinion. On July 23rd, EDF, the French shareholder of Taishan Nuclear Power, suddenly issued a statement, which mainly meant that if the fuel damage was put in France, SHUTDOWN would be overhauled, but whether China’s SHUTDOWN in depends on China’s opinions. The statement may be highly technical. Nearly two hours after EDF official website issued the press release, there were only five reprints and seven praises within one hour after EDF official Twitter was reprinted. It did not cause social media shock. However, a CGN statement on July 30th (the content is that Taishan Nuclear Power stopped to operate SHUTDOWN from the perspective of conservative decision-making according to relevant requirements, and just took advantage of this minor repair opportunity to check and repair this fuel rod damage problem in advance), which triggered the third round of secondary public opinion. Some media began to jointly ferment the second round of public opinion and this statement. It was even rumored that 75 fuel rods were damaged this time (the actual number was 5, accounting for 0.01% of the total).

On August 21-02-02, WeChat official account of nuclear energy industry published “Talk Together: The Story Behind Taishan Nuclear Power’s shutdown”, which explained in detail the causes, probability, maintenance difficulty and acceptability of fuel rod damage in shutdown, which is equivalent to a deep nuclear culture popularization and clarifies the facts. Tencent. Com, Sohu. Com and Beijing Business Today also reprinted some information.

So far, there have been no follow-up new reports from the mainstream media, but there are still many comments, inquiries and controversies about this incident on the Internet until December. The public has only seen some of the above facts due to factors such as education, industry, age and Internet habits, which is easy to take them out of

context. This article also specially consulted most of the media public information, only to sort out the causes and consequences.

At the same time, looking at CNN's operation techniques, we have to admit that it skillfully uses news language in reporting, expands risks in an empathetic way, avoids the important points, frequently uses sensitive words, and makes full use of the network to achieve the purpose of hype, which adds troubles to the already complicated international relations and affects the establishment of China's peace and safety culture atmosphere.

5 Thinking

Nuclear facility operating units are fully responsible for nuclear safety. When nuclear facility operating units adjust operational restrictions and conditions and report them to the administrative department of nuclear safety under the State Council for approval, they need multi-party participation and follow-up. This incident reflects the lack of mutual communication and cooperation among all parties, and the powers and responsibilities of Supplier, operating units and nuclear safety supervision departments should be further clarified.

News discourse [3] is a set of rhetorical discourse that pays attention to universality, concreteness and innovation, in order to achieve a certain purpose of public opinion. Media ecology holds that when the discourse shared by the knowledge interpretation community enters the discourse context of news production, it must face the problem of re-contextualization. It is not simply the transfer of meaning, but also pays more attention to the coupling relationship between science and media, actively participates in public expression, and especially achieves the expected reporting effect with the help of the communication power of the new media platform. In the process of reporting nuclear power events, story rhetoric can be introduced and used on the basis of scientific background. On the basis of seeking truth from facts, describing narration with scenes and sincere atmosphere can highlight the hardships and rigor behind scientific decision-making. Emphasizing the role of "experts" is also an effective way. The news media facing the public needs the scientific discourse of experts, while the knowledge community represented by experts needs the media to speak out to the society. Qiao Sukai (fuel rod maintenance expert) and David Fishman (Chinese name: Yu Dewei; Researchers in China's energy field and energy supervision have received good results.

6 Conclusions

1) It is considered that the media literacy of nuclear power journalists should be continuously improved, journalism professionalism suitable for nuclear safety should be established, the correct concept of event reporting should be cultivated, the emergency reporting mechanism should be established and improved, and the shortcoming of "individual narrative" should be remedied. The follow-up influence of reporting should be continuously paid attention to, and in-depth reporting should be carried out when necessary. Learn from the more and more in-depth "people-oriented" characteristics of accident reports in other industries. Nowadays, under the brand-new media ecological mode of joint reporting by mainstream media and self-media. In addition to the incident

itself, in-depth reporting and dealing with public opinion should also pay more attention to relevant people, such as involved operators, construction engineers, surrounding residents, etc., which is easy to arouse people's resonance and empathy. Contribute to the popularization of nuclear safety culture outside the nuclear industry [8].

2) Since the outbreak of pneumonia in COVID-19 in 2019 [7], the press release work as an important means of risk communication [8] has basically achieved normalization and institutionalization, and has played a role in meeting public information needs, curbing the widespread spread of rumors, appeasing social panic, ensuring social stability. Operation, boosting public confidence in anti-epidemic and other multiple functions, nuclear safety incident reporting and press release can also learn from this form, in the process, we can gain insight into public psychology, respond to public concerns, and enhance social communication.

3) It is also a continuous task to improve the effect of press release by strengthening the professional level and public orientation of press release internally. Information release should be more timely, standardized and consistent in caliber to achieve more accurate information push; The release of different information should be classified. Classification should answer questions according to the public's questions in public opinion, and use vivid ways such as diagrams, tables or dynamic evolution diagrams to popularize basic nuclear power knowledge, so that the public can understand the specific situation of events, eliminate unknown panic and relieve anxiety and panic.

4) In Taishan case, the incident report was issued by the official media, the clarification article was issued by different mainstream media, and the final overall incident review report was issued by WeChat official account in the nuclear industry. Different types of media have different audiences. Although the time response is timely, there is no continuity, and the general public cannot get in touch with the complete public opinion process of events. It is suggested to cultivate mainstream media neighborhoods and new media with a wide audience that can track, timely and continuously report the "nuclear safety" events. Nuclear power has developed rapidly in recent years, and international and domestic public opinion is unknown and changeable, which is also an inevitable choice to do a good job in public communication of nuclear power under the existing media ecology.

As early as more than 2,000 years ago, Shi Bo of Zhou Taishi put forward the famous proposition of "harmony with real creatures, but not continuity with the same" and "Guoyu Zheng Yu", which pointed out the systematic harmony, difference and diversity. At present, China has the largest scale of nuclear power under construction in the world, and its completed nuclear power operation performance is almost excellent. In the domestic and international media ecosystem, we should take seeking truth from facts as the basis, use appropriate reporting and public communication methods, make good use of news language and different narrative subjects to maintain our nuclear safety culture atmosphere, and nuclear safety's news in China is dominated by itself.

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