

Suggestion to Nuclear Safety Standard Endorsement of China

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Abstract. This paper introduces the current situation of nuclear safety standards endorsement management in China from two aspects of regulation basis and endorsement method. Give suggestions for China's nuclear safety standards endorsed management, in order to promote China's nuclear safety standards endorsement carried out more smoothly. The endorsement procedure and mechanism is the expansion of the endorsement application experience for the future, in order to meet the requirement of nuclear safety standards system in Nuclear Safety Law, gradually establish the nuclear safety standard to nuclear and radiation safety standards system in China.

1. Introduction about Nuclear Safety Standard Endorsement Mechanism of China

1.1. Regulation basis

China's nuclear safety regulations provisions for the endorsement of nuclear safety standards are that: Article 6 in "The Regulations of the People's Republic of China on the Supervision and Administration of the Civilian Nuclear Facilities Safety" (HAF001-1986) [1] is that, "The competent authority of nuclear facilities shall be responsible for the safety management of its nuclear facilities, and be accepted by the National Nuclear Safety Administration's nuclear safety supervision, ..."; Article 10 in "The Regulations of the People's Republic of China on Nuclear Safety Equipment Supervision and Management (HAF006-2007)" [2] provides that: "The civilian nuclear safety equipment industry standards shall be formulated by the competent department of the nuclear industry of the State Council, with the endorsement of the nuclear safety regulatory authority of the State Council," ; Article 11 is that "If corresponding national and industry standards have not yet been formulated, the civilian nuclear safety equipment design, manufacturing, installation, and non-destructive testing entities shall use the standards endorsed by the nuclear safety supervision authority of the State Council." Article 2.3 in "Safety Regulations for Civilian Nuclear Fuel Cycle Facilities" (HAF301-1993) [3] requires that: "The supervision of nuclear fuel cycle facilities safety by the national nuclear safety department shall be subject to the following main duties: (1) To formulate safety regulations and guidelines for nuclear fuel cycle facilities, review and endorse relevant safety standards." Based on the above nuclear safety regulatory requirements, National Nuclear Security Administration has the right to review and endorse nuclear safety-related industry technical standards endorsementd.

However, this work has not formalized standard and procedural operation over years. Until 2012, the jointly issued by the National Nuclear Safety Administration and the National Energy Agency document "Notification of interim measures on the management and endorsement of nuclear power



standards in the energy industry related to nuclear safety”, called No. 226. The notification fills the gap in China's nuclear safety standard endorsement work and the endorsement work then starts.

1.2. Endorsement method

No. 226 provides that “Nuclear Safety Supervision Division 1 is the centralized management department for standard endorsement work. Nuclear and Radiation Safety Regulations and Standards Review Committee is technical advisory organization standard endorsement. Endorsement secretarial group is set up at the policies and regulations research institution of Nuclear and Radiation Safety Center. The other departments, offices, and supervision stations of the National Nuclear Safety Administration, and other departments of the Nuclear and Radiation Safety Center participate in the endorsement work according to their functions and professional division, undertake corresponding tasks, and give corresponding support.”

The published NB standards only need to pass a technical review and a review of the National Nuclear Safety Administration's Nuclear and Radiation Safety Regulations and Standards Review Committee's Comprehensive Committee (hereinafter referred to as the "Regulatory Standards Review Committee"), and endorsement is relatively quick.

With regard to the endorsement of the revised NB standard, the National Nuclear Safety Administration has to go through at least five document reviews (confirmation of project materials, preliminary draft, exposure draft, review draft, permission draft) and four meetings (confirmation review meeting, preliminary draft review meeting, review draft review meeting, and permission draft review meeting) , that don't include the technical discussion meetings within the Nuclear Safety Center (hereinafter referred to as "the Center"). The process includes the two reviews by the National Nuclear Safety Administration to NB standard in the Regulations and Standards Review Committee, that is, the review of the nuclear safety-related confirmation opinion and the endorsement review report of the submitted permission draft. According to No. 226 and “Nuclear Safety Related Energy Industry Nuclear Power Standard Endorsement Management Procedures (Trial)”(hereinafter referred to as “Procedure”) requirement, the Nuclear Safety Center organizes review experts to carry out technical reviews at all stages of NB standard development and revision, and compose endorsement review reports to Nuclear Safety Supervision Division 1. Technical reviewers need 3-7 people or more, with an average of 2 years or more.

The endorsed NB standard should be added on the cover of the endorsement mark “RK”. Foreword adds “This standard has already been reviewed and endorsed by the National Nuclear Safety Administration” and its industry standard status remains unchanged. Since 2013, in accordance with the requirements of the National Nuclear Safety Administration, the nuclear and radiation safety center of Environmental Protection Ministry has successively carried out trial endorsement work for 30 NB standards. At present, the 12 NB standards have been endorsed by the National Nuclear Safety Administration, 5 NB standards have been endorsed review, 12 NB standards have been reviewed by the Committee, and the remaining 1 is at the corresponding technical review stage.

2. Suggestions on the Endorsement Management of China's Nuclear Safety Standards

The National Nuclear Safety Administration and the National Energy Administration have agreed to the endorsement of energy industry nuclear power standards. However, it is still in the initial stage of the trial. Many systems and mechanisms need to be improved in the pilot. The endorsement of nuclear safety standards requires not only stick to high standards, but also taking into account formulated standards that reflect the reality of China's nuclear power industry technology level. The high standards means not reducing the requirements of nuclear safety regulations to standards, and not reducing the measurement level required by standards of technical indicators, technical measures and management and other safeguard measures. The endorsed standards must meet the basic requirements of ensuring the achievement of nuclear safety goals through correct and effective implementation. And the standard technical level can reflect the current domestic advanced level or can be integrated with the international level. Considering the current level of nuclear power technology in China, it is to

consider the national conditions and combine actual conditions. The fundamental principles that should be stick to are to confirm whether the standards are integrated with national conditions, integrated with research and development, design, development, and industrial production of nuclear power technologies in China, whether they are related to China's nuclear safety legislation, supervision and management practices, and management systems of construction and operation of nuclear power plants. Whether the standard reflects both the advanced nature and the operability in line with the current level of China's actual technology.

2.1. Endorsement as one of the important means to establish the nuclear and radiation safety standards system.

After the issuance of the "Nuclear Safety Law," the nuclear safety regulators urgently need to review and plan the nuclear and radiation safety standards system. Given that the establishment of a nuclear and radiation safety standards system is a long-term process, how to rationally adopt nuclear safety-related technical standards developed by other departments is crucial to improve and perfect the nuclear and radiation safety standards system as soon as possible. The endorsement not only fulfills the regulatory responsibilities entrusted to the NNSA by the law, but also coordinates the relevant departments to integrate and rationally use the existing standards, to effectively support and supplement the nuclear and radiation safety standards system and effectively implement requirements in nuclear safety regulations. It is recommended that the National Nuclear Safety Administration make endorsement as an important mean to improve and perfect nuclear and radiation safety standards

2.2. Drawing on the experience of NRC endorsement management, strengthen the endorsement management of China's nuclear safety-related standards.

The NNSA should reference the United States NRC to set up a special mechanism, appoint staffs to be responsible for the work of communication and coordination with other relevant the State Council departments or standards organizations, trace and pay attention to the development and changes of relevant nuclear safety standards, and endorse, premise and regulate them in the relevant nuclear safety regulations and guidelines, strengthened coordination with standards organizations, and promote standards endorsement management. However, the NNSA should avoid the NRC disadvantages of being too fragmented and difficult to manage uniformly.

2.3. Define clearly responsibilities and division of standard management endorsement in relevant laws and regulations.

In accordance with the requirements of the "Nuclear Safety Law," the relevant management system should be improved, and the leading role of the government should be brought into full play in order to fully reflect the authority of the regulations and standards. For the management and endorsement procedures of nuclear safety standards, the relevant supervisory authorities shall issue more detailed guidance documents to clarify the status of the endorsement standards, make each work step has a clear counterparty or departments, so that there are more rules and regulations and the implementation of specific work procedures, and the process is smoother in management and endorsement.

2.4. Establish a reasonable and practicable endorsement mode to make process smoothly.

The current endorsement mode is "Energy Administration has established a batch of projects each year, submitted one batch, and the Nuclear Safety Administration confirms one batch and endorses one batch." The number of endorsement requirements is increasing, and the Nuclear Safety Administration lacks a systematic plan for endorsed standards. It is recommended that the National Nuclear Safety Administration organize experts to carry out a whole identification of the NB Standard System Table and screen them from maturity, urgency, and importance to determine the endorsement scope of NB standards. The present method of tracking the entire process of the revision of the industry standard occupies too many human resources of the National Nuclear Safety Administration and does not conform to the actual situation of China's nuclear safety regulatory organizations, resulting in a long

endorsement period. It is recommended to reduce the number of endorsements for NB standard revision projects in the future (unless which is a particularly urgent revised industry standard), and to focus on published industry standards endorsement, categorize by professional fields and adopt batch and centralized assessments to make endorsed reviews systemized. This model can shorten the endorsement cycle, make it more convenient for centralized management, and is more conducive to the implementation of nuclear safety regulatory requirements in technical standards.

2.5. Improve a fully endorsed talent mechanism.

The National Nuclear Safety Administration should perfect the talents training system and encouraged mechanism. An expert system of responsibilities is required in the "Procedures". In the revision process of the NB standard system, responsible experts need to track and participate in the process of making and revising the NB standard. However, in the actual work, because the center's endorsement review experts are assigned by the leaders of each business division, the responsible experts in each stage are not the same, and the replacement of the responsible experts will lead to repeated review conclusions and inconvenience to the actual work. Therefore, it is recommended that in accordance with Article 1 of the "Procedure", "The National Nuclear Safety Administration shall set up an expert database for the evaluation of standards, which shall include relevant experts in nuclear and radiation safety regulations and standards review committees and experts from the Nuclear and Radiation Safety Center. The expert database is managed by the secretary group." a library of standard evaluation experts is established to attract more experienced experts in the nuclear industry to participate in the endorsement review as soon as possible, clarifying the purpose and significance of the NB standard endorsement review to experts in the expert database. Procedures, and specify the specific mechanisms appointed by responsible experts, to better promote the smooth development of the NB standard endorsement.

2.6. Strengthen the publicity of the endorsement mechanism.

To make the relevant parties are fully aware of the importance and necessity of the endorsement, so that the relevant managers and specific workers can understand and be familiar with the endorsement process and the rules that should be followed.

3. Conclusion

In the future work, the existing technical standard resources should be fully utilized. Many of the existing national standards and industry standards are related to nuclear safety, and many standards have been proven to meet the requirements of nuclear safety regulations after years of engineering practice. These standards can introduced by means of standard endorsed by nuclear and radiation safety standards system, according to nuclear and radiation safety supervision, especially the voluntary standards such as mean standards, which should be absorbed as far as possible the existing or be formulated industrial standard. In this way, we can make full use of the mature experience of industry, and can reduce duplication of construction and avoid multiple standards to maximize the national interest.

References

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- [2] The Regulations of the People's Republic of China on Nuclear Safety Equipment Supervision and Management [Z]. 2008-1-1.
- [3] Safety Regulations for Civilian Nuclear Fuel Cycle Facilities [Z]. 1993-6-17.