

ESTABLISHMENT AND STATUS OF THE RADWASTE MANAGEMENT STANDARDS IN CHINA

ZHUO Fengguan

Institute for Standardization of Nuclear Industry, CNNC

1. Introduction

In the development and application of nuclear power and nuclear technologies, the safety management of radwaste is of great significance just as nuclear safety. Whether the management problem of radwaste can be solved safely and economically affects not only the health and safety of future generations, but also the prospects of nuclear power.

In the last 30 years and more, with the development of nuclear industry in China, the government, nuclear industry circles and scientists have paid great attention to the safety management of radwaste. Especially in the last 10 years, with the implementation of the nuclear power programmes, the safety management of radwaste has been legalized steadily. NEPA, NNSA, and the competent authorities concerned have engaged in establishing and promulgating policies, regulations, and a series of technical standards about the safety management of radwaste, and efforts are being made to complete and perfect related regulations and standards.

This paper introduces briefly the status and programs of radwaste safety management standards in China, including principles, organizations, and procedures for drafting the standards.

2. Principles for Drafting Standards

Radwastes, especially high-level radwastes and transuranic wastes, because of their radioactive properties, will cause long-term threat or hazards to public health, safety, and environment if not properly managed and finally disposed of in safety. Hence, the management of radwaste relates not only to complicated activities in technical and economical fields, but also to social-political issues which are highly concerned by and sensitive to the general public and various social communities.

In order to ensure the safety management of radwaste, besides the general principles, the following basic principles have been formulated and followed in drafting the relevant standards.

2.1 Safety first

The basic safety objective of radwaste management lies in the appropriate and optimum methodology to be used in radwaste management, so that unacceptable hazards to human health and the environment can be avoided at present as well as in the future; the design and operation of any facility and system or any activity in respect of radwaste management must meet the requirements for radiation and environmental protection, and the principles for protecting future generations.

2.2 Economy

This principle is subject to the following conditions;

- a. The feasibility in technique and economy must be considered when the specific objectives and requirements of each process in radwaste management are determined;
- b. For the standardization of a specific process in waste management, both its economic rationality and the comprehensive economic rationality in the whole waste management system shall be considered. Although there are some difficulties in this cost-benefit analysis, in any case, it is important to define this principle; and
- c. Taking into account the technical and social factors, the ALARA principle has to be implemented to keep the individual and the collective exposure lower than the specified limits.

2.3 Taking disposal as the core in waste management

The radwaste management must proceed from the requirements of the final disposal, so that the establishment of final safe disposal standards shall be, first of all, stressed, including those of the disposal technology, and the siting, design, operation, safety analysis, environmental impact assessment, monitoring, and quality assurance of disposal facility. Moreover, the standardization of other processes in waste management shall facilitate the final safety disposal of the waste.

2.4 Adopting international and foreign state-of-the-arts standards according to national conditions

It is a common principle to be followed in various projects, particularly, for the standardization of radwaste management. Firstly, it is easily accepted by all circles of the society if the international and foreign general safety principles and limits in this field are incorporated into Chinese standards. Secondly, the implementation of this principle will facilitate the international co-operation.

3. Organizations and Approval Procedure

The current organizations and procedure for establishing the standards of radwaste management in China are shown in Fig. 1, which is consistent with the radwaste management system approved by the authorities concerned.

WG—Working Group

ISNI—Institute for Standardization of Nuclear Industry

CNNC—China National Nuclear Corporation

TC 58/SC 2—The National Technical Committee for Standardization of Nuclear Energy/
Subcommittee for Radiation Protection

NEPA—National Environment Protection Agency

NNSA—National Nuclear Safety Administration

CSBTS—China State Bureau of Technical Supervision

WGD—Working Group Draft

CD—Technical Committee Draft

DGS—National Standard Draft

DEJ—Professional Standard Draft

EJ—Nuclear Professional Standard of the People's Republic of China

4. Status of the Standards

A comparatively integrated and applicable system associated with the radwaste management standards has begun to take shape. It embodies the experience in radwaste management over the past 30 years in China, and reflects the generally accepted safety standards and advanced experience in international radwaste management.

At present, there are 43 standards in the system, in which 16 have been issued; 15 are to be issued; and 12 are being drafted. These standards can be classified into two categories as a whole. One includes general standards for radwaste management; and the other includes those to be used in controlling or managing the processes in radwaste management, e. g. production and discharging control, collection, treatment, volume reduction, solidification, packaging, storage, transportation, and final disposal of radwastes. Furthermore, the latter also includes some standards to be specially used in the safety management of wastes emanating from mining and milling of uranium and thorium ores.

Some typical examples of these standards are shown in Table 1.

It should be noted that most of the existing standards only serve the safety management of low- and intermediate-level radwastes. The standards for high-level radwaste disposal are being studied. This kind of standards will also be established with the issuance of the relevant policy for high-level radwaste disposal in China.

Table 1 Some Typical Radwaste Management Standards

No.	Symbol	Title	Note
1	GB xxxxx	Regulation for radioactive waste management	to be issued
2	GB 9133-88	The standard for classification of radioactive waste	
3	EJ 352-88	Radioactive waste management glossary	
4	GB 13367-92	Principles for the exemption of radiation sources and practices from regulatory control	
5	GB 13695-92	Normalized limits of radioactive effluent discharges for nuclear fuel cycle facilities	
6	GB 9134-88	The technical rules for solid radioactive waste processing system of light water reactor plants	
7	GB 9135-88	The technical rules for liquid radioactive waste processing system of light water reactor plants	
8	GB 9136-88	The technical rules for gaseous radioactive waste processing system for light water reactor plants	
9	EJ xxx	The technical rules for radioactive waste treatment systems of fuel reprocessing plants	in drafting
10	EJ xxx	The technical rules for volume reduction systems of low- and intermediate-level radioactive waste	to be issued
11	GB xxxxx	Characteristic requirements for solidified waste of low- and intermediate-level radioactive waste—cement solidified waste form	to be issued
12	GB xxxxx	Characteristic requirements for solidified waste of low- and intermediate-level radioactive waste—plastic solidified waste form	to be issued
13	GB xxxxx	Characteristic requirements for solidified waste of low- and intermediate-level radioactive waste—bitumen solidified waste form	in drafting
14	GB 7023-86	Long-term leach testing of solidified radioactive waste forms	
15	GB 13711-91	Safety Standard for low- and intermediate-level radioactive solid waste packages	
16	EJ xxx	Concrete container for low- and intermediate-level radioactive solid waste	in drafting
17	EJ xxx	Steel container for low- and intermediate-level radioactive solid waste	in drafting
18	GB 11928-89	Regulations for interim storage of low- and intermediate-level radioactive solid waste	
19	GB 11929-89	Regulations for designing storage building of high-level radioactive liquid waste	
20	GB 11806-89	Regulation for safe transport of radioactive materials	
21	GB 9132-88	Regulations for shallow-ground disposal of low- and intermediate-level radioactive solid waste	
22	GB 13600-92	Regulations for disposal of low- and intermediate-level radioactive solid waste in rock cavities	
23	GB xxxxx	Site selection regulations for shallow-ground disposal of low- and intermediate-level radioactive solid waste	in drafting
24	GB xxxxx	Waste acceptance criteria for low- and intermediate-level solid waste disposal facility	in drafting
25	EJ/T xxx	Standard format and content of a safety analysis report for low- and intermediate-level radioactive solid waste disposal facility	in drafting
26	GB/T xxxxx	Standard format and content of environmental impact for shallow-ground disposal of low- and intermediate-level radioactive solid waste	to be issued
27	GB xxxxx	Regulations for the safety management of wastes from the mining and milling of uranium and thorium ores	to be issued

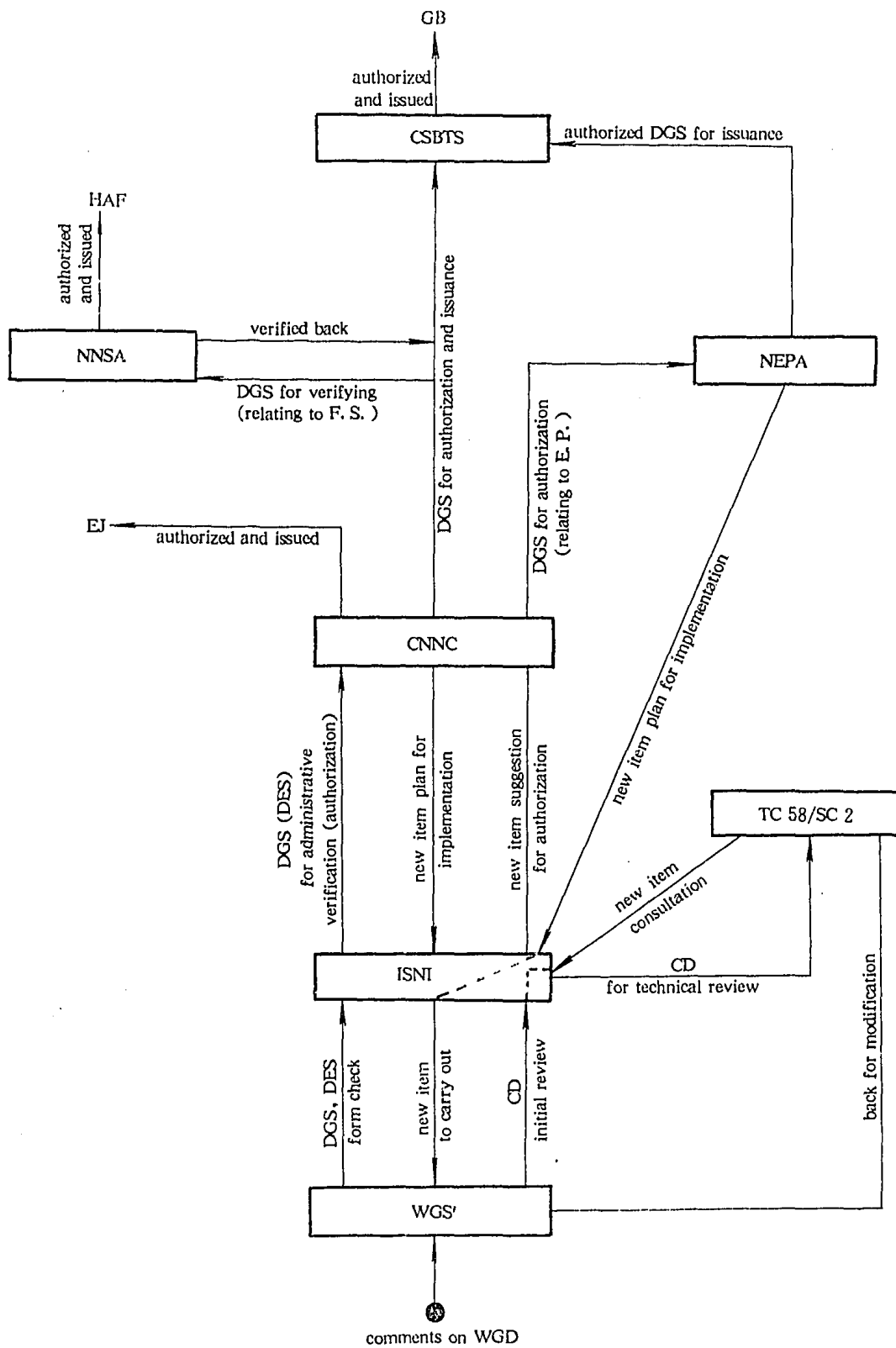


Fig. 1. The organizations and approval procedure