

Introduction on Revised Technical Standard for LILW Incineration in Korea

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1. Introduction

Incineration Criteria for Low- and Intermediate-Level Radioactive Wastes was promulgated in 1997. This technical standard is giving the information about application scope, design criteria for incineration equipment, waste acceptance criteria, operation criteria during the operation of incineration equipment such as incineration method, emergency response, etc. The management by monitoring and measuring the effluent gas discharged from incineration equipment is very important not only for radionuclides but also for air pollution substances.

This study shows the introduction on recently revised guidelines Technical Standard for LILW Incineration (NCCS Notice No. 2017-6), in order to provide the exact information on technical criteria for LILW incineration for the operator of related facilities and for the licensee who is going to have a plan to get an issue for LILW incineration.

2. Incineration criteria

2.1 Purpose & Scope of Application

The purpose of this notice is to specify technical standards for ensuring the safety of incineration facilities and the incineration of radioactive wastes pursuant to Subparagraphs 4 (d) and 10 (a) of Article 10, Subparagraph 3 of Article 22, Subparagraph 4 (c) of Article 40, and Subparagraphs 4 (d) and 10 (a) of Article 87 of the Regulations on the Technical

Standards for Radiation Safety Control, Etc [1].

The standards on incineration facilities of solid or liquid combustible LILW provided in the Regulations on the Technical Standards for Radiation Safety Control, Etc. shall be applied [1].

2.2 Design Standards of Incineration Facilities

The incineration facilities shall consist of the following equipment and shall be designed to ensure structural safety: pre- treatment equipment (if pre-treatment is required), incinerator equipment, off-gas treatment equipment, liquid effluent collection equipment (treatment equipment included if treated in house), ash collection equipment (treatment equipment included if treated in house), equipment for monitoring processes and off-gases, ventilation equipment, and other subsidiary facilities.

2.3 Off-gas Treatment Equipment

The weekly average radioactive concentration of gases and the annual average exposure to the residents living around the facility to release gases, emitted from the incinerator into the air, shall satisfy the Notice of the Nuclear Safety and Security Commission (Standards for Radiation Protection, Etc.) outside the boundary of the exclusion area.

The off-gas generated from the incinerator into the air after their proper treatment shall be satisfied with effluent quality standard such as SO_x, NO_x, CO, HCl and dust, etc.

Table 1. Applying facilities for incineration criteria

Name	KAERI Treatment facility for combustible RW	Treatment for Hanul Vitrification equipment
Location	KAERI, Daejeon	Hanul NPP, Uljin
Radioactive Waste	Combustible LILW generated from KAERI decommissioning project (Uranium conversion facility and Research reactor 1&2)	Combustible LILW including spent resin generated from Uljin NPP operation
Treatment technology	Incineration	Incineration & vitrification
Treatment capacity	~25 kg/h	~25 kg/h

Table 2. Main changes in revision of incineration criteria

Contents	Before revision	After revision
effluent quality standard following as treatment capacity	None	- Quotation of standards from 3 related legislations - [Special provision] Applying the nearby treatment capacity regulated in 3 related legislations
Contents and concentration of effluent quality standard	Provided as Table 1 in NSSC Notice	Quotation of standards from 3 related legislations

3. Revision of technical standard

There was no effluent quality standard for incineration capacity in previous standard. And, effluent quality standard has never been revised since the promulgation of NSSC Notice, while effluent quality standard which is quoting in NSSC Notice has been revised in every 5 years. The 3 related legislations are as follows; Enforcement Regulations for Clean Air Conservation Act [2], Enforcement Regulations for Persistent Organic Pollutants Control Act [3], and Enforcement Regulations for Malodor Prevention Act [4].

For these reasons, NSSC Notice was revised in April 2017. The 2 facilities, KAERI treatment

facility for combustible radioactive waste and Hanul vitrification equipment (Table 1), shall meet the revised criteria according to the NSSC Notice, especially, for the effluent quality standard.

Main changed in revised incineration criteria are shown in Table 2.

4. Conclusion

Recently revised technical standard for LILW incineration (NSSC Notice No.2017-6) was introduced in this study. Additional operation manual of related facility could be prepared and modified for the application of the revised incineration criteria, especially, with regarding to the measurement period of each effluents and management method including abnormal operation.

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REFERENCES

- [1] NSSC Notice No.2017-6, "Incineration Criteria for Low- and Intermediate-Level Radioactive Wastes" (2017).
- [2] Enforcement Regulations for Clean Air Conservation Act (2018).
- [3] Enforcement Regulations for Persistent Organic Pollutants Control Act (2018).
- [4] Enforcement Regulations for Malodor Prevention Act (2018).