Exemption from regulatory control of nuclear wastes

This Guide is in force as of 1 May 1992 until further notice. It replaces Guide YVL 8.2, issued on 1 July 1985.

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Authorization

The Finnish Centre for Radiation and Nuclear Safety (STUK) issues detailed regulations concerning the safety of the use of nuclear energy by virtue of Section 55, paragraph 2, point 3 of the Nuclear Energy Act.

The YVL guides are rules an individual licensee or any other organization concerned shall comply with unless some other acceptable procedure or solution is presented to STUK by which the safety level laid down in an YVL guide is achieved.

Translation. Original text in Finnish.

1 General

Part of the wastes generated in the controlled areas of nuclear facilities is so low–level that its treatment, storing and disposal as radioactive waste is not practicable in view of the radiation protection principles. On certain condition, waste of this kind can be exempted from regulatory control, and disposed of or recycled like ordinary waste. Exemption of waste can be unrestricted or restricted.

Unrestricted exemption is applicable to waste that, due to its low activity, shall not be regarded as nuclear waste as referred to in Section 3 of the Nuclear Energy Act. Then the method for the disposal or recycling of the waste need not be defined and fixed activity constraints for the waste are applied.

In the case of restricted exemption, the transferee and the disposal or recycling method for the waste shall be defined and the activity constraints shall be set on the basis of case–by–case consideration. By virtue of Section 10 of the Nuclear Energy Decree, the provisions of the Nuclear Energy Act are then not applicable to the exempted waste.

This guide presents the general principles to be applied when waste is removed from the controlled area of a nuclear facility to be disposed of or recycled.

2 Radiation dose and activity constraints

The radiation dose and activity constraints given below apply only to radioactive substances originating in the use of nuclear energy.

It is a general radiation protection requirement that exemption of wastes from one nuclear power plant or a nuclear facility of other kind, shall not give rise to radiation exposure of the public or the workers at the waste treatment facility exceeding

a) an effective dose of 0.01 mSv in a year to the most exposed individuals (members of the so called critical group), or

b) a collective dose commitment of 1 manSv per year of practice.

The following activity constraints are applicable to unrestricted exemption:

a) The total activity concentration, averaged over a maximum amount of 1000 kg of waste, shall not exceed 1 kBq/kg of beta or gamma activity or 100 Bq/kg of alpha activity. In addition, no single item or waste package weighing less than 100 kg may contain more than 100 kBq of beta and gamma activity or 10 kBq of alpha activity.

b) The total surface contamination of non–fixed radioactive substances, averaged over a maximum area of 0.1 m^2 for accessible surfaces, shall not exceed 4 kBq/m^2 of beta and gamma activity or 400 Bq/m^2 of alpha activity.

For restricted exemption, activity constraints based on a case–by–case approval by the Finnish Centre for Radiation and Nuclear Safety are applied which, however, shall not exceed those included in Section 10, points 1 and 2 of the Nuclear Energy Decree.[1]

3 Exemption procedure

3.1 General requirements

Management of exempted wastes shall comply with the regulations included in the waste management and other legislation.

The wastes to be exempted shall not contain nuclear materials as referred to in Sections 1 and 3 of the Nuclear Energy Act.

It shall be possible to detect or reliably estimate the activity of the wastes to be exempted.

[1] (only in the translation)

Nuclear Energy Decree, Section 10, points 1 and 2:
1) The average activity concentration in the waste is less than 10 kBq/kg.
2) The total activity of exempted waste received by a transferee in one year is less than 1 GBq and the alpha activity less than 10 MBq.

The procedures applied in the exemption of wastes shall be described in detail in the guidelines for waste treatment which are subject to approval by the Finnish Centre for Radiation and Nuclear Safety. The Centre controls by inspections the removal of the exempted wastes from the controlled zone. A summary of all the wastes annually exempted from regulatory control shall be presented to the Finnish Centre for Radiation and Nuclear Safety in accordance with Guide YVL 1.5.

3.2 Unrestricted exemption

For the exemption of waste from regulatory control, an application shall be submitted to the Finnish Centre for Radiation and Nuclear Safety, in which the origin and characteristics of the waste and the methods to be used for the determination of the activity of the waste are described. After the Finnish Centre for Radiation and Nuclear Safety has approved the application, the waste can be removed from the facility as soon as it arises.

Unrestricted exemption is not applicable to such waste as is highly volatile or flammable, is of significant practical value or can otherwise particularly easily cause radiation exposure.

3.3 Restricted exemption

For restricted exemption, a licence for the transfer of nuclear waste as referred to in Section 48 of the Nuclear Energy Decree is required, if the waste is transferred to another holder. The application for the transfer of waste shall include, besides the information required in Section 48 of the Nuclear Energy Decree, a description of the origin and characteristics of the waste, of the methods used to determine the activity of the waste, of the method to be used for disposing or recycling the waste and of the radiation exposure arising from the exemption from regulatory control of the waste.

In case the waste is not transferred to another holder, an application for the exemption of the waste including the same information as the application for a waste transfer licence referred to above, shall be submitted to the Finnish Centre of Radiation and Nuclear Safety.

Wastes are removed from the controlled area occasionally, fairly large amounts of waste at a time. The decisions on exemption made by the Finnish Centre for Radiation and Nuclear Safety either apply to a single quantity of waste or are constantly valid in case waste arises repeatedly and its disposal or recycling method remains unchanged.

The Finnish Centre for Radiation and Nuclear Safety supervises by inspections that the waste is disposed of or recycled in accordance with the approved application.

4 Determination of the activity of waste

The methods to be used for the determination of the activity in waste and the extent of the measurements shall be selected considering the origin and characteristics of the waste and the distribution of activity. The methods to be used shall be such that the upper bounds for the activities of the most significant nuclides in the waste are obtained with high certainty. To provide against instrument failures or human error, redundant methods shall be used. The measuring instruments shall be calibrated with sufficient frequency.

Dose rate measurement is suitable for use as a redundant method or as the principal method when the nuclide composition of the waste is known with sufficient accuracy.

Gammaspectrometric measurement of waste packages or items applies particularly well to wastes with an uneven activity distribution. The activities of only beta or alpha emitting substances shall then be estimated by indirect methods.

Sampling and analysis of the samples applies to wastes in which the radioactive substances are sufficiently evenly distributed or the activity distributions are known beforehand.

5 References

1 Exemption of Radiation Sources and Practices from Regulatory Control, Interim Report, IAEA–TECDOC–401, Vienna 1987.

2 Principles for the Exemption of Radiation Sources and Practices from Regulatory Control, IAEA Safety Series 89, Vienna 1988.

3 Exemption from Regulatory Control, Recommended Unconditional Exempt Levels for Solid Radioactive Materials, IAEA Working Document, Vienna 1991.

4 Radiation Protection Criteria for the Recycling of Materials from the Dismantling of Nuclear Installations, CEC Radiation Protection Report No 43, Luxembourg 1988.

5 Application in the Nordic Countries of International Radioactive Waste Recommendations, The Radiation Protection Institutes in Denmark, Finland, Iceland, Norway and Sweden, Helsinki 1986.

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