PROCEDURE V.2 JULY 2020

GUIDELINES FOR DISPERSIBLE RADIOACTIVE SUBSTANCES (DRS)

INTRODUCTION

This procedure is intended for employees who are currently employed in the institutions that are part of the complex license Randwyck, who are involved in the purchase, management and use of Dispersible Radioactive Substances (DRS). Conditions to the purchasing, management and use of DRS are written down in this procedure and follow prevailing legislation and the local Regulation Randwyck.

DISPERSIBLE RADIOACTIVE SUBSTANCES (DRS)

A DRS is a radioactive source which is not encapsulated, nor a device. The use of DRS may lead to radioactive contamination of people, materials and surroundings.

Within the complex license Randwyck, DRS are used for the following purposes (justifications[1] between brackets):

- Research and experiments (I.B.3)
- Production of research and therapeutic products (I.B.5)
- Education (I.D.1)
- Exercises (I.D.3)
- Medical therapy (II.A.1)
- Clinical research based on medical indication (II.A.2)
- (Bio)medical research on volunteers (II.A.3)
- Veterinary diagnostics (II.B.1)

The governmental Regulation basic safety standards radiation protection (Regeling basisveiligheidsnormen stralingsbescherming (Rbs)) and the complex license have certain requirements on the possession and use of DRS. These requirements are explained in this procedure.

Specific requirements are established for the administration of radioactive substances to patients and/or test subjects, or the instructing thereof. These requirements are written down in the BIG law (Beroepen in de Individuele Gezondheidszorg), the Decree basic safety standards radiation protection (Besluit basisveiligheidsnormen stralingsbescherming (Bbs)) and related legislation. These requirements can be found in the procedure 'Authorisation and competence regarding medical radiological procedures'.

[1] *Regeling basisveiligheidsnormen stralingsbescherming, attachment 2.1 sub section A (Dutch only)*

RESPONSIBILITIES

For a complete description of tasks and responsibilities of all personnel involved in the radiation protection organization, we refer to the Regulation Randwyck. This procedure mentions the aspects specifically applying to DRS.

General coordinating expert (Algemeen Coördinerend Deskundige (ACD)):

- supervises, on behalf of the licensee, compliance to the complex license;
- supervises the actuality and validity of the complex license and files changes to this license with the government on behalf of the entrepreneur;
- supervises the correct administration of the presence of all dispersible radioactive substances within the complex license;
- supervises the compliance of conditions formulated in the written internal approval (SIT) with regards to the correct use of DRS;
- reports at least once a year to the licensee and the government concerning the presence, the application and the control of the use of DRS.

Coordinating expert (Coördinerend deskundige (CD)):

- is responsible for the risk analyses in which the risks associated with the use of DRS are described and the potential exposure for people and environment is quantified;
- supervises the purchasing of DRS with regards of the requirements as described in this procedure;
- supervises the registration and management of DRS;
- supervises the compliance of the conditions regarding purchase, use and storage of DRS;
- supervises the monitoring of workplaces in which DRS are used;
- advises on the plan/design and classification of the workplaces in which DRS are used;
- advises on correct dose monitoring of employees and work place;
- supervises the execution and quality of the yearly report to the ACD regarding purchase, (stock) management and use of DRS.

Radiation protection officer (Toezichthoudend Medewerker Stralingshygiëne (TMS)[2]):

- supervises the correct receipt and handling of DRS as described in this procedure;
- executes a visual check on received shipments of DRS;
- executes contamination tests or supervises the execution of contamination tests;
- supervises and ensures the correct use of DRS within the framework of the written internal permission and the conditions as written down in this procedure;
- contributes to the handling of incidents;
- supervises the correct registration of DRS present at the location and a reliable stock management;
- supervises the compliance of the transport procedure when transporting DRS;
- instructs personnel where necessary with regards to the correct use of DRS;
- maintains a local management system which always reflects the current situation with regards to stock management of DRS;

[2] *For the supervision of the application of DRS, a training level as radiation safety expert (stralingsbeschermingsdeskundige) necessary; Regeling basisveiligheidsnormen stralingsbescherming art. 5.2 (Dutch only)*

- supplies yearly up-to-date information to the SBE with regards to purchase, usage, and stock management of DRS.

CONDITIONS ON THE USE OF DISPERSIBLE RADIOACTIVE SUBSTANCES (DRS)

For the purchase, use and storage of DRS, specific requirements are in place for ensuring safety. The purchase and application of DRS must always be within the boundaries of the complex license, written internal permission and under supervision of the CD and the TMS.

Prior to the intended use, organizational measures have to be in place in the department where DRS are to be used, under responsibility of the CD. The nature, quantity and use of the DRS need to be within the boundaries of the complex license. If this is not the case, the CD needs to consult with the ACD, who needs to file a formal request for change of the license with the ANVS (Autoriteit Nucleaire Veiligheid en Stralingsbescherming). A handling time of at least 14 weeks needs to be taken into account.

If it is not necessary to change the complex license, the CD must ensure that the DRS and its application is, or will be, permitted in a written internal permission (SIT) and the risks of the presence or use of the DRS are analysed and written down in a risk analysis.

Practical conditions for purchase and use are:

a. a received shipment of DRS is unpacked and checked in a designated location, appointed by the TMS;
b. when a package is damaged or in case a radiation incident has occurred during shipment, the TMS needs to be informed and a contamination check needs to be performed prior to unpacking;
c. when a shipment containing a DRS is delivered outside working hours, the TMS is informed of this delivery and the DRS is immediately stored in a storage facility;
d. the empty packaging of a DRS needs to be cleared of any radioactive contamination on the inside and the outside before leaving the location, as well as the removal of all labels or indications that the packaging used to contain radioactive substances.

MEASURES TO PREVENT IMPROPER USE OF DRS

Improper use, unintentional exposure and unintentional spreading of DRS need to be prevented when storing and handling DRS. The following practical requirements are applicable:

a. handling of DRS can only take place in designated and specifically designed areas, fitted with signalling and proper classification[3];
b. only personnel with at minimum a radiation protection degree of TMS-VRS D (Radiation Protection Officer – Dispersible Radioactive Materials level D) are allowed to independently handle DRS;
c. employees need to keep their knowledge and skills at level by participating in refresher courses offered by the employer or the scientific community;

[3] *Besluit basisveiligheidsnormen stralingsbescherming art. 7.7 (Dutch only)*

d all actions with DRS are performed under skilled supervision;
e an active access policy is in place restricting areas designated for the use of DRS to authorized personnel only;
f employees are individually monitored for exposure to radiation[4];
g procedures and specific guidelines are in place for handling DRS; employees are checked on following these procedures and guidelines;
h personal protection measures are available for the prevention of contamination with DRS;
i no flammable, fire promoting or explosive substances are present in close proximity to the DRS, unless absolutely necessary for business operations;
j adequate equipment is present for measurement of radioactive contaminations;
k areas where DRS are used are regularly checked for radioactive contamination, following a specific procedure;
l when a radioactive contamination has been found, this will be cleaned up by or under responsibility of the TMS;
m in case of radioactive contamination, (regular) cleaning of rooms or areas can only take place after the rooms or areas have been cleared by the TMS;
n materials used or present in areas containing DRS can only leave these areas after they have been checked for radioactive contamination and cleared.

INSPECTIONS RELATED TO DISPERSIBLE RADIOACTIVE SUBSTANCES

When working with DRS there is a risk of radioactive contamination. To prevent the occurrence of contaminations and the spreading thereof, the guidelines listed below need to be followed:

- activities need to be prepared in advance, and specific moments where the chance of spreading and contamination are possible need to be identified; specific methods should be defined to prevent the chance of spreading and contamination;
- specific means for removing radioactive contaminations should be present at the workplace;
- radioactive contaminations need to be removed by or under supervision of the TMS in such a way that further spreading is prevented;
- structural, periodic contamination controls need to be in place in areas where DRS are used;
- contamination controls need to be performed using suitable equipment and standardized procedures to ensure reliable results;
- the results for contamination tests need to be reported to users of the checked areas; when legal limits are exceeded or other particularities are noticed, this will also immediately be reported to the radiation protection unit (SBE); at least once a year contamination test results of the entire year are reported to the SBE.

RADIOACTIVE WASTE

Waste, contaminated with radioactive substances, needs to be separately disposed of. The proper way of handling radioactive waste has been written down in the procedure Collection, storage and transference of radioactive waste.

[4] *See Procedure 'Categorization, dose control and medical supervision exposed employees'*

ABBREVIATIONS

ACD	General coordinating expert
Bbs	Besluit basisveiligheidsnormen stralingsbescherming
CD	Coordinating expert
DRS	Dispersible radioactive substance
SBE	Radiation protection unit
TMS	Radiation protection officer

REFERENCES

- Besluit basisveiligheidsnormen stralingsbescherming (Dutch only) https://wetten.overheid.nl/BWBR0040179/2018-07-01
- Regeling basisveiligheidsnormen stralingsbescherming (Dutch only) https://wetten.overheid.nl/BWBR0040509/2019-02-15
- Procedure Uitvoeren besmettingsmetingen (Dutch only)
- Procedure Collection, storage and transference of radioactive waste
- Procedure Categorization, dose control and medical supervision exposed employees