Commission for the Protection
From Ionising and Non-Ionising Radiation

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Issue date:- May 2022

Guidance on the designation of Controlled and supervised areas under the Basic Safety Standards for Ionising Radiation Regulations (SL585.01)

1. Overview

The Basic Safety Standards for Ionising Radiation Regulations, SL585.01 (henceforth referred to as the regulations) require undertakings to set up either Controlled or Supervised areas based on their safety assessment

Section 2 of this document reviews the **Regulatory Requirements**, section 3 gives **Guidance** on the designation of controlled or supervised areas

2. References to Controlled and Supervised Areas in the regulations

2.1. Definitions

"controlled area" means an area subject to special rules for the purpose of protection against ionising radiation or preventing the spread of radioactive contamination and to which access is controlled;

"supervised area" means an area subject to supervision for the purpose of protection against ionising radiation;

2.2. Classification of workplaces- Regulation 45.

(1) Undertakings shall ensure that workplaces are designated as either controlled or supervised, where appropriate, on the basis of an assessment of the expected annual doses and the probability and magnitude of potential exposures.

(2) Undertakings shall designate as a controlled area any area under his control which:

(a) it is necessary for any person who enters or works in the area to follow special procedures designed to restrict significant exposure to ionising radiation in that area or prevent or limit the probability and magnitude of radiation accidents or their effects; or
(b) any person working in the area is likely to receive an effective dose greater than 6mSv a year or an equivalent dose greater than three-tenths of any relevant dose limit referred to in these regulations.

(3) Undertakings shall designate as a supervised area any area under his control, not being an area designated as a controlled area:

(a) where it is necessary to keep the conditions of the area under review to determine whether the area should be designated as a controlled area; or
(b) in which any person is likely to receive an effective dose greater than 1mSv a year or an equivalent dose greater than one-tenth of any relevant dose limit referred to in these regulations.

(4) Undertakings shall keep under review the working conditions in controlled and supervised areas.

2.3. Requirements for Controlled areas- Regulation 46.

(1) The minimum requirements for a controlled area are the following:

(a) The controlled area shall be delineated and access to it shall be restricted to individuals who have received appropriate instructions and shall be controlled in accordance with written procedures provided by the undertaking. Wherever there is a significant risk of the spread of radioactive contamination, specific arrangements shall be made, including for the access and exit of individuals and goods and for monitoring contamination within the controlled area and, where appropriate, in the adjacent area.
(b) Taking into account the nature and extent of radiological risks in the controlled area, radiological surveillance of the workplace shall be organised in accordance with the provisions of regulation 48.
(c) Signs indicating that the area is Controlled, the nature of the sources and their inherent risks shall be displayed.
(d) Working instructions appropriate to the radiological risk associated with the sources and the operations involved shall be laid down.
(e) The worker shall receive specific training in connection with the characteristics of the workplace and the activities.
(f) The worker shall be provided with the appropriate personal protective equipment.

(2) The undertaking is responsible for implementation of these duties taking into account the advice provided by the radiation protection expert.

2.4. Requirements for Supervised areas – Regulation 47.

(1) The requirements for a supervised area are the Supervised areas. following:

(a) taking into account the nature and extent of radiological risks in the supervised area, radiological surveillance of the workplace shall be organised in accordance with the provisions of regulation 48;
(b) signs indicating that the area is Supervised, the nature of the sources and their inherent risks shall be displayed;
(c) if appropriate, working instructions appropriate to the radiological risk associated with the sources and the operations involved shall be laid down.

3. Guidance

This section gives guidance on the interpretation of the regulatory requirements.

The undertaking should consult an RPE about the need to designate a controlled or supervised area

3.1. Guidance on Controlled Area designation

3.1.1. General guidance

The main purpose of designating controlled areas is to make sure that necessary steps are taken to prevent or restrict routine and potential exposures to employees and other persons that may be exposed to ionising radiation. Entry and working in a Controlled area need to follow specific procedures

Undertakings should designate as a controlled area any area under its control which has been identified by the safety assessment as an area in which:

(a) it is necessary for any person who enters or works in the area to follow special procedures designed to restrict significant exposure to ionising radiation in that area or prevent or limit the probability and magnitude of radiation accidents or their effects; or

(b) any person working in the area is likely to receive an effective dose greater than 6 mSv a year or an equivalent dose greater than three-tenths of any relevant dose limit.

Special procedures may be necessary to restrict the possibility of significant exposure.

Controlled areas are normally required in the following instances:

(a) the external dose rate in the area exceeds 3 μSv per hour when averaged over the working day;

(b) the hands of an employee can enter an area and the 8-hour time average dose rate in that area exceeds 75 μSv per hour;

(c) there is a risk of spreading significant radioactive contamination outside the working area;

(d) it is necessary to prevent, or closely supervise, access to the area by employees who are unconnected with the work with ionising radiation while that work is under way;

(e) employees are liable to work in the area for a period sufficient to receive an effective dose in excess of 6 mSv a year.In addition, an area should be designated as a controlled area if the dose rate (averaged over a minute) exceeds 7.5 μSv per hour and employees untrained in radiation protection are likely to enter that area, unless the only work with ionising radiation involves a radioactive substance dispersed in a human body and none of the conditions in (a) to (e) apply.

The designation of a controlled area is also likely to be required when the instantaneous dose rate exceeds 100 μSv per hour even though the dose rate, when averaged over a working day, is less than 7.5 μSv per hour. In addition, an area should be designated as a controlled area if the dose rate (averaged over a minute) exceeds 7.5 μSv per hour and the work being carried out is site industrial radiography.

3.1.2. Responsibility for designating a Controlled Area

The undertaking in control of an area is responsible for designating that area. Where that undertaking assigns temporary control of the area to a contractor, that contractor is responsible for deciding whether or not to designate the area as a controlled area. Contractors should co-operate with site undertakings, either to inform them about the extent of any controlled area they create, or to pass on information about the risks arising from their work with ionising radiation.

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3.1.3. Designation as a Controlled Area on the basis of special procedures

The undertaking's safety assessment will indicate where special procedures are necessary to restrict exposure. Undertakings should designate an area as a controlled area if these procedures are specific to an area and require particular instructions to be followed by those who enter or work in the area.

Undertakings should put in place special procedures to prevent accidental exposures when people enter high-dose-rate shielded enclosures or plant. An example is where it is necessary for employees to follow a defined procedure involving the use of a suitable dose rate meter to check that a radiation source is safe before entry.

If special procedures are necessary, undertakings should designate the area as a controlled area whether or not the dose rate is above 3 µSv per hour.

In deciding whether or not a controlled area is needed, undertakings should consider:

(a) which people are likely to need access to the area;

(b) the level of supervision required;

(c) the nature of the radiation sources in use and the extent of the work in the area;

(d) the likely external dose rates to which anyone can be exposed;

(e) the likely periods of exposure to external radiation;

(f) the physical control methods already in place, such as permanent shielding and ventilated enclosures;

(g) the importance of following a procedure closely in order to avoid receiving significant exposure;

(h) the likelihood of contamination arising and being spread unless strict procedures are closely followed;

(i) the need to wear PPE in that area;

(j) maximum doses estimated for work in the area.

In addition, undertakings should designate an area as controlled if:

(a) access is foreseeable to that area by people, such as office staff, whose work does not normally involve ionising radiation;

(b) normal control measures for an area have to be suspended for work such as maintenance or source changing;

(c) people are likely to be exposed to significant levels of surface or airborne contamination in the area, in excess of appropriate derived working levels or derived air concentrations;

(d) Radiation protective equipment should be worn while working in the area.

3.1.4. Designation of Controlled Areas in the case of radionuclides in the human body

Designation will probably be necessary in limited situations, for example where a patient remains in a hospital or clinic after the therapeutic administration of a radiopharmaceutical and:

(a) the work with ionising radiation involves a radioactive substance dispersed in a human body where that substance emits gamma rays and the product of activity and total gamma energy per disintegration exceeds 150 MBq.MeV; or

(b) the patient is undergoing brachytherapy.

3.1.5. Designation of a Controlled Area taking account of physical features

When considering the extent of any controlled area, take account of the physical boundaries, such as walls and partitions around the working area. If it is more convenient to use these boundaries (for example because of the need to control access), they can be used rather than a smaller part of the area where dose rates or contamination levels are significant.

These boundaries should not be too far from the area of concern to allow proper control of the area. Once such an area has been designated, it is subject to all the legal requirements applying to controlled areas.

3.1.6. Temporary de-designation of Controlled Areas

If the periods during which work with ionising radiation takes place are clearly defined, follow a regular pattern, or are only intermittent, undertakings can de-designate on a regular basis. An example of de-designation would be to allow cleaners to have routine access where this is appropriate. Undertakings should take sufficient steps to remove the need for designation of the area by, for example, isolating an X-ray generator from the power supply or removing any radioactive substances or making them safe. Undertakings should include these steps in their written procedures.

3.1.7. Temporary designation of a Controlled Area for a particular task

An undertaking may decide it is unnecessary to designate an area as a controlled area because employees do not enter that area and physical safeguards prevent accidental exposures. If contractors have to enter the area for particular tasks, such as source changing or maintenance, it may be necessary to designate such areas temporarily under specified conditions.

3.1.8. Demarcation of Controlled Area

The Controlled Area needs to be physically demarcated to restrict unauthorised access. If the area does not key **control** access, then:

a) the area is under direct supervision of competent authorised persons

b) the area is in a larger area e.g. a Supervised Area, which is sufficiently secure to prevent unauthorised access.

3.1.9. Signage

The Controlled Area should be marked out at its entry point by suitable signage that meets with at least the following requirements:

a) Indicates the area is ‘Controlled’.

b) Shows a ‘Trefoil’ sign.

c) Indicates the nature of the ionising radiation hazard (e.g. ‘X-ray’ or ‘Unsealed radioactive material’).

3.2. Guidance on Supervised Area designation

The decision to designate an area as a Supervised area depends both on the assessment of likely doses in that area and the probability that conditions might change. For example, where an area needs to be kept under review because of the possibility that radioactive contamination might spread, you should designate the area as a supervised area.

It is not necessary to designate a supervised area outside every controlled area. For example, if a controlled area has been designated on the basis of external dose rate, and conditions in adjacent areas are unlikely to alter significantly, a supervised area will not be necessary unless a person is likely to receive a dose in excess of 1 mSv a year in those adjacent areas.

In some laboratories only small quantities of unsealed radioactive substances are used. In these situations, it may not be appropriate to designate the room as a controlled area to make sure that specific procedures are followed by those who enter or work there. In such a laboratory, there will be general arrangements for preventing and cleaning up any contamination arising from spillages. Undertakings should designate at least part of the laboratory as a supervised area if contamination could build up over a period of some weeks as a result of not following these arrangements. The part of the laboratory designated as a supervised area should be chosen to reduce the risk of contamination, for example around a fume cupboard.

Undertakings can choose boundaries for the supervised area which are convenient. Once such an area has been designated it is subject to all the legal requirements applying to supervised areas.

3.2.1. Demarcation of Supervised Area

The Supervised Area should be delineated where appropriate and subject to radiological surveillance.

3.2.2. Signage

The Supervised Area should be marked out at its entry point by suitable signage that meets with at least the following requirements:

a) Indicates the area is 'Supervised.

b) Shows a 'Trefoil' sign.

c) Indicates the nature of the ionising radiation hazard (e.g. 'X-ray' or 'Unsealed radioactive material').

3.3. Guidance on area designation applicable to both Controlled and Supervised areas

3.3.1. Area designation during transport or movement on site

The dose rates inside and outside vehicles used to carry packages containing radioactive material may be in excess of the levels at which areas may require designation. For example, designated areas may be required in the cab of a vehicle or around a vehicle or package during a temporary stop.

3.3.2. Designation of areas on the basis of annual dose

In practice, it is often difficult to predict annual doses received by employees from knowledge of dose rates in working areas because:

(a) dose rates are seldom constant over long time periods and within the physical boundaries of areas;

(b) there are significant variations in the pattern of work for individuals;

(c) the duration of an individual's exposure in the areas may be difficult to estimate.

Consequently, the expected annual dose is not likely to be the main criterion in most cases for deciding whether an area needs to be designated as a controlled area. One exception might be areas in radon-affected workplaces where high radon levels are known to occur and no special procedures need to be followed by employees. Also, where employees work for about 2000 hours a year in an area where the external dose rate routinely exceeds 3 µSv per hour, that area may need to be designated as a controlled area because that individual would be likely to receive a dose greater than 6 mSv a year.

An undertaking should not intentionally create in any area conditions which would require that area to be designated as a controlled area unless that area is for the time being under the control of that undertaking.

3.3.3. Designation of areas after an accident

An accident might create conditions which would warrant the designation of a controlled area in a place where the undertaking does not normally have control. In such cases, that undertaking should, where possible, have the access to that area restricted until the situation returns to normal or until the emergency services take over control of it.

An undertaking should designate as a supervised area any area under its control, not being an area designated as a controlled area –

(a) where it is necessary to keep the conditions of the area under review to determine whether the area should be designated as a controlled area; or

(b) in which any person is likely to receive an effective dose greater than 1 mSv a year or an equivalent dose greater than 5 mSv a year for the lens of the eye or greater than 50 mSv a year for the skin or the extremities.