University of Chemistry and Technology, Prague	
Title	**DIRECTIVE No. A/S/961/10/2025**
Subject	**Rules for operation of sources of harmful radiation**
Applicability	All university
Effective from	9 January 2025
Effective to	Indefinite
Revision	As necessary
Cancelled	Decree No. 30.12/05 of 30 June 2005
Prepared by	972 – Department of Safety and Risk Prevention
Issued by	Prof. Ing. Milan Pospíšil, CSc. – Rector

Article

Introductory provisions

1) This Directive is issued in order for the University of Chemistry and Technology, Prague (hereinafter as 'UCT Prague') to comply with its obligations as employer when operating sources of ionising and non-ionising radiation under Section 102, Para 1 and Section 103, Para 1, letter f) of Act No. 262/2006 Coll., the Labour Code, as amended (hereinafter as the 'Labour Code'), Section 5 of Act No. 263/2016 Coll., the Atomic Act, as amended (hereinafter as the 'Atomic Act') and in accordance with Decree No. 422/2016 Coll., on Radiation Protection and Security of a Radioactive Source, as amended, Government Regulation No. 91/2015 Coll., on Health Protection against Non-Ionizing Radiation, as amended, standards CSN EN 60825-1 Safety of laser products – Part 1: Equipment classification and requirements and TNI IEC/TR 60825-1 Safety of laser products – Part 14: A user's guide.
2) This Directive stipulates more detailed requirements on health protection of persons when performing activities with a higher risk to life and health and against effects of harmful radiation in connection with the relevant provisions of Directive A/S/961/1/2024 'Systém organizace a řízení bezpečnosti a ochrany zdraví při práci' (System of Organisation and Management of Occupational Safety and Health) and Directive A/S/961/2/2025 'Rules of Operation for Laboratories'.
3) Article VIII of this Directive serves as the monitoring programme that UCT Prague as a holder of a SUJB licence to manipulate with unsealed sources of ionising radiation is obliged to establish under Section 24, Para 7 of the Atomic Act and Section 66 of Directive No. 422/2016 Coll.

4) For the purposes of this Directive, the term ‘person’ or ‘persons’ refers collectively to employees, students and other persons, unless the context implies otherwise.

5) This Directive shall also apply to persons participating in study stays or lifelong learning programmes held at UCT Prague departments.

Article II

Terms, definitions, abbreviations

The definitions of terms used in this Directive are listed in Directive A/S/961/1/2024. In addition, certain specific terms are used in this Directive with the following meaning:

Safety measures	Concrete measures adopted to eliminate occupational risks that can be unsured by technical, organisational or educational means.
Person supervising radiation protection (Supervising person)	An employee authorised by the rector to perform continuous surveillance of compliance with radiation safety at work requirements on sources of ionising radiation and to monitor and evaluate fulfilment of obligations of the licence holder to ensure all measures in accordance with the requirements of the Atomic Act.
Generator of ionising radiation	Equipment that artificially generates ionising radiation but does not contain radioactive substances in which radiation is generated as a result of a physical process (such as acceleration of particles or braking radiation). It includes X-rays, particle accelerators, plasma generators or high intensity discharge lamps.
Germicidal lamp	A source of ultraviolet radiation in the C spectrum (UVC) with a wavelength of 180 to 280 nm used to sterilise air, liquids and surfaces, or to damage DNA and RNA of the present microorganisms by a direct impact of non-ionising radiation.
Ionising radiation	Transmission of energy in the form of particles or electromagnetic waves with a frequency greater than or equal to $3 \cdot 10^{15}$ Hz (ie wavelengths shorter than 100nm) capable of creating ions.
Category 3 work	Work for which a source of non-ionising radiation (NIR source) is used to which persons are exposed and during which the maximum permissible levels of NIR set out in legal regulations are exceeded.
Laser	A device that generates coherent (ordered) electromagnetic radiation at a particular wavelength in ultraviolet, visible or infrared range of the spectrum. It includes, for example, laser diodes, CO_2 laser tubes, Nd:YAG crystals.
Laser device	A technical system composed of a laser and other components for amplifying or focusing generated electromagnetic radiation (optics, cooling, electronics, control software etc) designated for a specific purpose or use.

Class 2 laser	Lasers with a low output power (less than 1 mW) that emit radiation in the visible spectrum (wavelength range between 400 and 700 nm) that do not pose any risk of damage to a person's eyes or skin in case of accidental and short-term exposure (< 0,25 s). According to CSN EN 60825-1 ed.3, class 2 is subdivided into class 2 and 2M.
Class 3 laser	A laser with a medium output power (less than 500 mW) whose radiation may cause also serious damage to a person's eyes due to the effect of a direct or reflected beam (depending on the output and wavelength of the emitted radiation). According to CSN EN 60825-1 ed.3, class 3 is subdivided into class 3R and 3B.
Class 4 laser	A laser with a high output power (greater than 500 mW) whose radiation may cause severe/permanent damage to a person's eyes or skin not just due to the effect of a direct or reflected beam but also caused by diffuse reflection, or cause fire to flammable substances also at a large distance (tens of kilometres). Class 4 lasers includes all lasers that exceed the limits applicable to class 3 according to CSN EN 60825-1 ed.3.
Harmful radiation	Ionising and non-ionising radiation capable of harming human health (depicted in Fig. 1 and 2).
Non-ionising radiation	Static electric and magnetic and time-varying electric, magnetic and electro-magnetic fields and electromagnetic radiation from artificial sources with a wavelength greater than 100 nm.
Maximum permissible levels of NIR	Cut-off values specified in applicable legal regulations that are based directly on proven health effects and data on their biological effects; provided they are not exceeded, they guarantee that employees and natural persons in communal spaces exposed to non-ionising radiation are protected against all its known direct biophysical and indirect effects.
Responsible person	A person that is responsible for ensuring safe operation of a source of harmful radiation in accordance with the original documentation of the given equipment (user's manual), legal and other regulations on OHS/FP and internal regulations on safety of UCT Prague. The responsible person is appointed by the head of the relevant organisational unit of UCT Prague (faculty, department, unit).
Person directly supervising radiation protection	A person responsible for continuous surveillance of activities involving radiation carried out at designated workplaces and of compliance with set rules of radiation protection by employees and measures to minimise their exposure to IR.
Occupational exposure to harmful radiation	Situations in which employees may be exposed to harmful radiation during performance of work and under defined working conditions. The exposure may be one-off (causing acute effects) or chronic (causing cumulative or delayed effects).

Radionuclide source	A source of ionising radiation that contains a radioactive substance for which the sum of radionuclide activity ratios and activity exemption levels for these radionuclides is greater than 1 and, at the same time, the sum of radionuclide activity concentration ratios and activity concentration exemption levels for these radionuclides is greater than 1.
Radioactive substance	Any substance that contains a radionuclide or is contaminated by it at a level that requires regulation under the Atomic Act due to potential exposure.
Exposed worker	Any natural person subject to occupational exposure in a planned exposure situation.
Supervised area	Areas that are subject to continuous surveillance for the purposes of radiation protection.
Output power of laser	The amount of energy emitted by the laser per unit of time typically measured in milliwatts (mW). In case of point lasers this refers to the amount of nominal power given on the label of the given device. In case of pulsed lasers, the output may be significantly higher. In case of line lasers, the output power is at 60 to 70% of the nominal power as some energy is transformed to heat.
Source of ionising radiation	A radioactive substance and object or equipment that contains or releases ionising radiation, or a generator of ionising radiation.
Source of non-ionising radiation	Any equipment that emits electromagnetic radiation that does not have sufficient energy to ionise atoms or molecules, but which has, due to its output power and wavelength of the emitted radiation, potential to cause harm to human health. It may refer to equipment that emits microwave radiation, infrared radiation, visible light or ultraviolet radiation (eg lasers, laser equipment or germicidal lamps).

The abbreviations used in this document have the following meaning:

OHS	Occupational health and safety
CSN	Czech technical standard
IARC	International Agency for Research on Cancer
IR	Ionising radiation
NIR	Non-ionising radiation
HSM	Harmful substances and materials
PPE	Personal protective equipment
RA	Radioactive
SUJB	State Office for Nuclear Safety
UV	Ultraviolet radiation

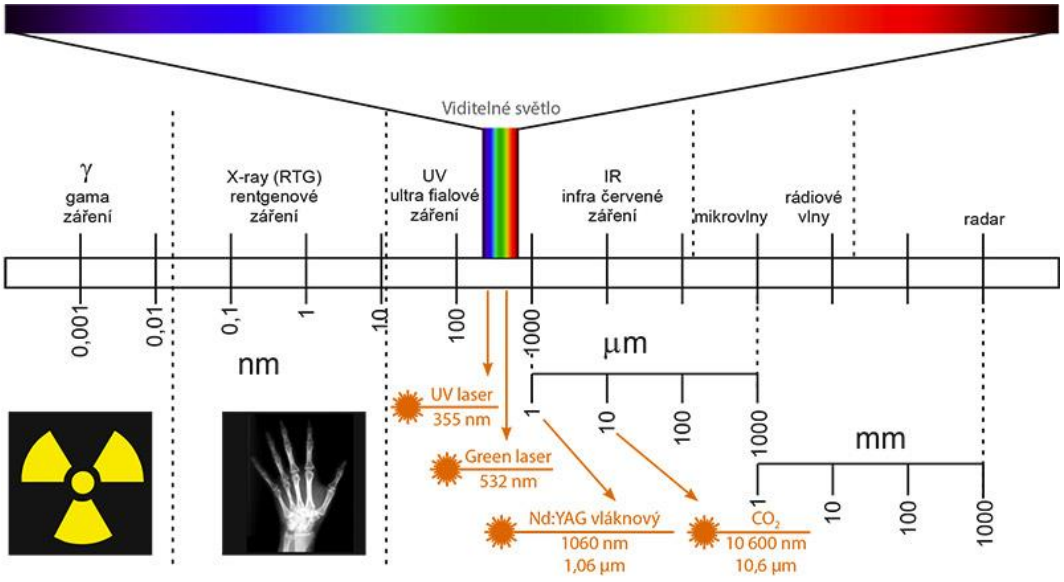
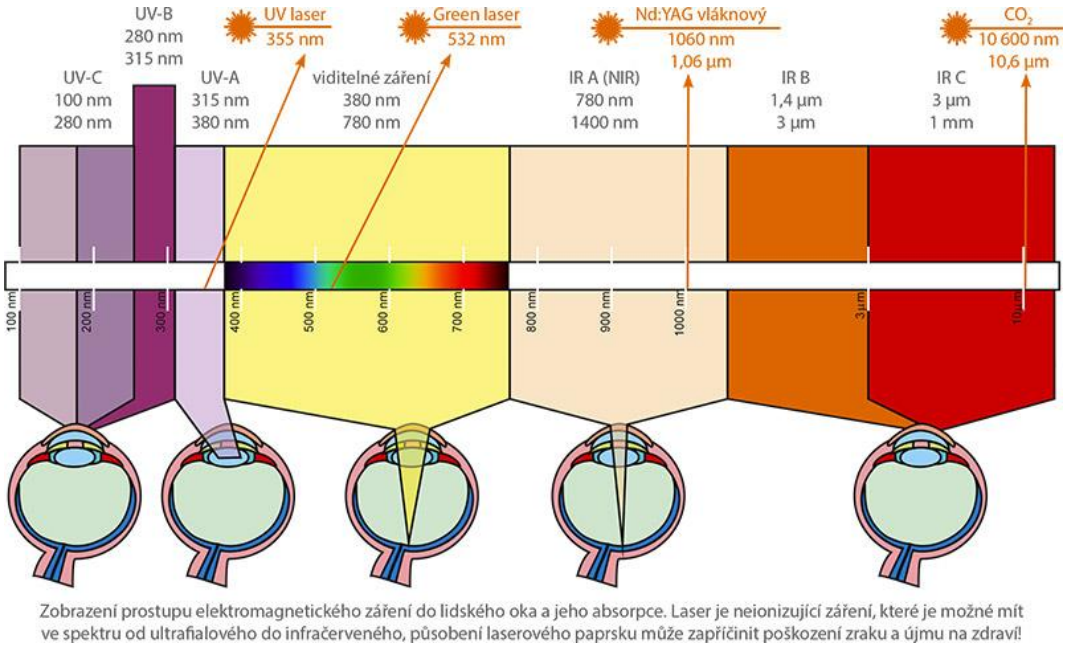


Fig. 1 (source: https://www.lt.cz/)



Zobrazení prostupu elektromagnetického záření do lidského oka a jeho absorpce. Laser je neionizující záření, které je možné mít ve spektru od ultrafialového do infračerveného, působení laserového paprsku může zapříčinit poškození zraku a újmu na zdraví!

Fig. 2 (source: https://www.lt.cz/)

Article III

General rules and requirements applicable to workplaces with IR/NIR sources

1) When working with IR/NIR sources, every person is obliged to act responsibly with regard to the harmfulness of the emitted radiation and bearing in mind that exposure to harmful radiation has a cumulative effect on the human body. Every person is thus obliged to work so that their activity harms neither them nor other persons and when using harmful radiation, they must comply with all safety measures arising form this Directive and the instructions of the head of registration of IR/NIR sources.

2) Workplaces and areas where IR/NIR sources are used must be adapted to this use, in particular they must be designed so that access of unauthorised persons, theft, damage or unauthorised use of IR/NOR sources are prevented.

3) Sufficiently large safety labels with the symbols of the relevant hazards and additional information on the nature of the harmful radiation must be placed on a visible place on the entrance door to the workplace:

   - Harmful ionising radiation.
   - Harmful radioactive substances.
   - Harmful non-ionising radiation.
   - Harmful laser radiation or Laser workplace of class 3B or class 4.

   Further, the door must be labelled with the label UNAUTHORISED ENTRY PROHIBITED, or with other symbols (eg Supervised area).

4) In case of a NIR source whose radiation is/may be emitted to the open space (eg lasers, germicidal lamps), a warning must be placed visibly in front of the entrance to the room that the equipment is in operation, or that entry of unauthorised personnel is prohibited (eg a label or a light board) to avoid unwanted exposure. During work with NIR sources it

is necessary to close the door and lock it from inside (unless there is a knob from the outside).

5) In case of an IR generator whose radiation is/may be emitted to the open space (eg equipment with an X-rays lamp), a warning must be placed visibly in front of the entrance to the room that the equipment is in operation, or that entry of unauthorised personnel is prohibited (eg a label or a light board) to avoid unwanted irradiation. During work with this IR generator, it is necessary to close the door and lock it from inside (unless there is a knob from the outside).

6) At workplaces where class 3B or class 4 lasers that emit radiation to the open space are used, the windows in the room must be secured with an appropriate impermissible barrier, the walls must be coated in a matte, anti-reflective coating.

7) Only exposed workers may enter a workplace where a Supervised area is defined following authorisation from the person directly supervising radiation protection or the Supervising person. When accompanied by the person directly supervising radiation protection or the Supervising person, also workers whose work is unconnected to work with IR sources may enter the Supervised area, but only provided all IR sources are shielded so that the worker is not exposed to irradiation. Only exposed workers may work with IR sources in the Supervised area.

8) Special requirements on the operation of laboratories where activities involving radiation are performed are given in Directive A/S/961/2/2025.

Article IV

Requirements on safe use of NIR sources

1) A NIR source can be used only in compliance with the conditions set by the manufacturer according to the user's manual and instructions of the person responsible for the operation of the given NIR source.

2) Used lasers and laser equipment must be properly labelled with hazard labels that contain information about the class of the laser and potential hazard of irradiation of operators of NIR in accordance with CSN EN 60825-1 ed.3. The manufacturer is responsible for the proper classification and labelling. If the information about the class of the laser is not available, classification must be deduced from the output power of the laser and the wavelength of the emitted radiation according to Fig. 3.

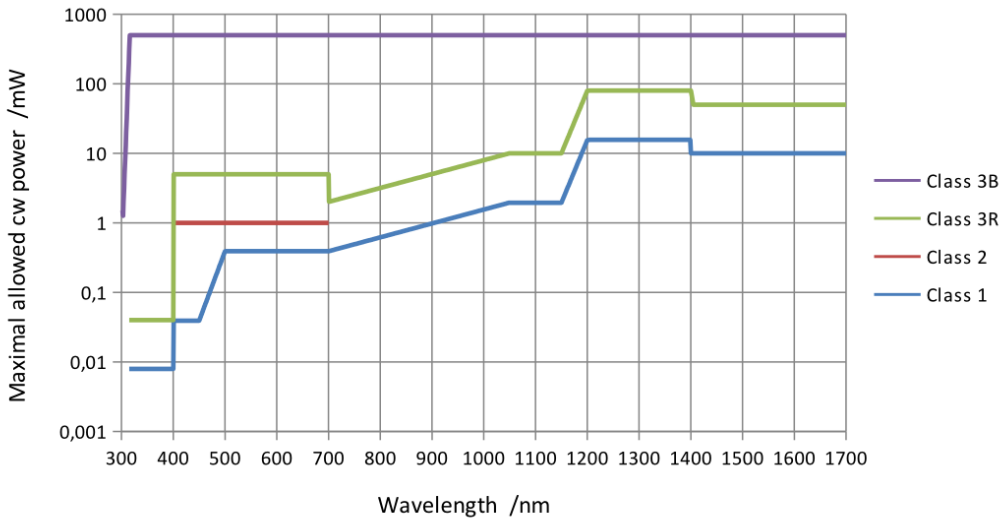


Fig. 3

3) Class 3 and class 4 lasers must by equipped (by the manufacturer) with a light or acoustic signalling system of operation.

4) All class 3B and class 4 laser equipment must be equipped with a protective cover (enclosure) that prevents contact between the human body and NIR (incl. stray radiation) and the control panel must be placed so that when manipulating with it, the operator of NIR is not exposed to radiation.

5) If NIR sources emitting harmful radiation to the open space are used, proper safety measures must be adopted to prevent any risk of irradiation of persons, or to minimise it to an acceptable level (eg using protection equipment of skin and eyes).

6) Only persons who have been authorised to perform the above activities by the person responsible for the operation of the facility ('authorised persons') may work independently with NIR sources that emit harmful radiation into the open space. These are usually academic and research workers or students in Doctoral study programmes who carry out scientific or other specialised activities there. Students performing practical exercises may work with this NIR source only under the supervision of the person acting as a supervisor[1].

7) Before starting work with a NIR source the use of which may result in occupational exposure to harmful radiation, each person must be properly familiarised with:

   - this Directive,
   - potential risks linked to using the given NIR source,
   - safe working procedures and instructions to use the given NIR source,
   - prohibited activities,
   - requirements on PPE when working with NIR sources and instructions on their safe use (see the manufacture's user's guide for the given NIR source),

[1] A teacher (ie the head of the practical or substitute teacher) or a UCT employee authorised by them, or a student in a Doctoral study programme enrolled in studies at UCT Prague who is qualified to work with the given NIR source can act as the person acting as a supervisor.

- direct and indirect effects of non-ionising radiation on health and how to identify them (acute and chronic effects),
- procedures in case an extraordinary event should occur (first aid, telephone numbers to call for help, fault reporting).

This information is provided by the responsible person, or another qualified person (eg the OHS officer or the HSM officer at the given organisational unit of UCT Prague provided they have the necessary knowledge). The knowledge acquired by the trainees is tested in an interview.

8) When using class 2 and class 3R lasers, such as laser pointers or laser rangefinders, all persons must comply with the general safety measures taking into regard the output power of the given radiation. It is strictly prohibited to look into the laser beam, point the laser beam at eye level of other persons, point at other persons or operators of vehicles. In case the laser pointer or laser rangefinder has an output power greater than 5 mW, it is a class 3B laser.

9) In case of class 3B and class 4 lasers the use of which may result in exceeding the maximum permissible NIR values according to applicable legal regulations (Act No. 291/2015 Coll.), responsible persons and persons performing supervision must regularly (once in 3 years) undergo specialised training on legal and other regulations in the given area, requirements for workplace layout and organisation of work and on safety measures for preventing unwanted exposure of persons to non-ionising radiation. The knowledge of the trained persons must be tested in an interview. This training may only be conducted by qualified persons – the laser safety officer with qualifications according to standard TNI IEC/TR 60825-14, or a person qualified in risk prevention under Act No. 309/2006 Coll. with appropriate professional knowledge in the given area.

10) At workplaces where germicidal lamps are used, it must be ensured by appropriate and sufficiently effective safety measures that no person may be exposed to radiation under standard operation conditions.

    According to IARC, UV radiation is classified as a proven human carcinogen (group 1); therefore, any exposure to UV radiation increases the risk of skin cancer. Therefore, there is no threshold value of UV radiation under which exposure might be considered harmless for health. UV Hazard Function, which indicates the value of the dimensionless spectral hazard coefficient of UV radiation (S_λ) at its wavelength, is used for approximate information about the seriousness of UV radiation exposure risk (see Fig. 4).

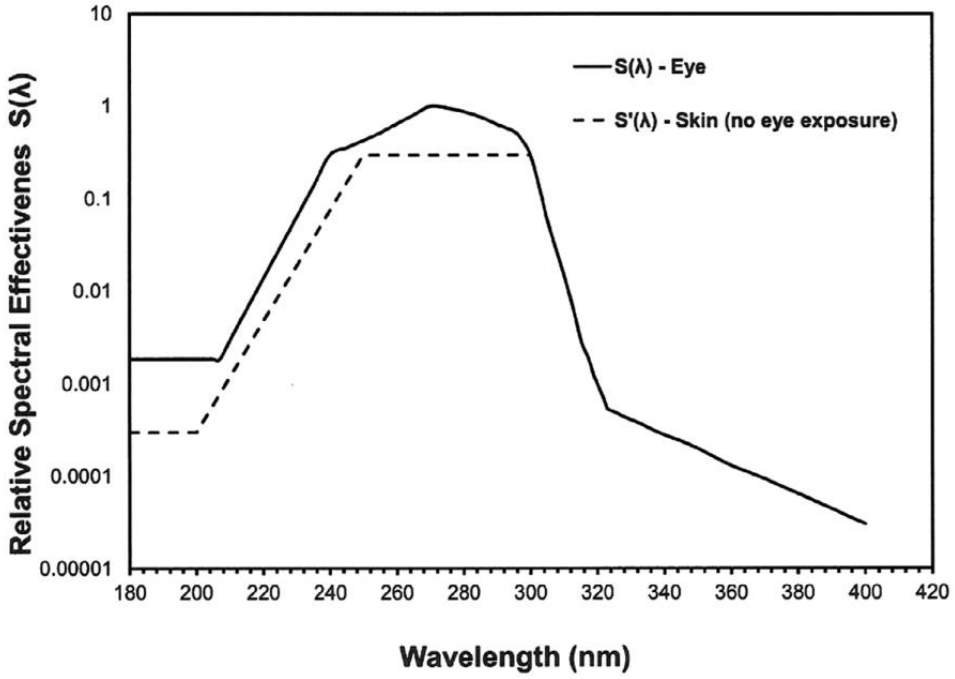


Fig. 4 (source: DOI: 10.1111/php.13402)

11) Direct germicidal lamps (eg ceiling lights or portable lamps) must be switched off before people enter the room. Indirect germicidal lamps (flow boxes) may be used in the presence of people only if the protective cover is properly closed. All germicidal lamps must be regularly checked by a responsible person for mechanical damage (incl. the condition of the protective covers).

12) If relevant in view of the existing health risks, all persons working with NIR sources must wear protective goggles with special filters that block radiation of the wavelength emitted by the given equipment, as well as suitable clothing for skin protection (incl. forearms) and hand protection (gloves) in accordance with the instructions of the manufacturer of the given equipment. To protect exposed skin from UV radiation, it is necessary to use a suitable protective cream with a minimum SPF of 50. Creams with a chemical filter must be applied approximately 30 minutes before possible exposure to UV radiation and the coating must be renewed several times a day. After working with germicidal lamps, it is necessary to wash hands thoroughly with soap and disinfect them.

13) At workplaces where class 3B and class 4 lasers are used that emit beams into the open space, upon entering the workplace, or starting work with the laser, all persons must remove any metal and shiny accessories (eg bracelets, rings and chains).

14) In case NIR sources, in particular germicidal lamps, are used for which zero exposure of persons to harmful radiation by NIR cannot be ensured by technical nor organisational measures, evaluation of potential exposure burden pursuant to GR No. 291/2015 Coll. must be performed and the potential health risks must be evaluated. Further, measures must be adopted so that the work is performed in a way that:

- a minimum number of persons are exposed,
- a minimum portion of the human body is exposed,

- each individual exposure does not exceed 2 minutes, or the total exposure does not exceed 5 minutes per day,
- PPE and protective creams are properly used.

15) In case the evaluation of NIR exposure shows that sanitation limits (maximum permissible levels) have been or may be exceeded, the work is category 3 work, ie hazardous work within the sense of Section 39 of Act No. 258/2000 Coll., on the Protection of Public Health, as amended. In this case, this work must be registered, meaning chronological records must be kept for every person performing this work that must include the following information:

    - first name, last name,
    - type of exposure, characteristics of NIR to which the person was exposed,
    - date and total time of exposure to NIR,
    - dates and types of performed preventive health checks and their conclusions.

    The responsible person is responsible for proper keeping of these records and they also archive these records to be used in case of an inspection by public health protection bodies.

16) When a direct or reflected laser beam or UV-C radiation enters the eye or when skin is exposed to UVC radiation for more than 2 minutes, further exposure must be avoided and medical assistance sought.

Article V

Head of registration of sources of non-ionising radiation

1) The head of registration of NIR sources coordinates fulfilment of obligations of UCT Prague in connection with the operation of NIR sources the use of which may result in harm to human health. The main tasks of the head of registration of NIR sources include:

    - keeping the register of sources of non-ionising radiation pursuant to Art. XI of this Directive,
    - detection and assessment of exposure of persons and the level of non-ionising radiation at UCT Prague workplaces where these levels might be exceeded,
    - proposing measures to protect health of employees when working with NIR and prevent exceeding the maximum permissible values of non-ionising radiation.

2) At the same time, the head of registration of NIR sources also acts as the advisor on laser safety at UCT Prague pursuant to Art. 4.5.1 of standard TNI IEC/TR 60825-14. In this connection, they will in particular:

    - provide methodological guidance to UCT Prague employees in the implementation of requirements on laser safety pursuant to applicable legal and other regulations,
    - perform assessment of risks to which employees may be exposed when using non-ionising radiation,
    - cooperate with the heads of individual workplaces on proposing and implementing safety measures to reduce the risk of occupational exposure to non-ionising radiation.

Article VI

Requirements on safe use of IR sources and ensuring radiation protection

1) An IR source may be used only in compliance with the conditions set by the manufacturer and in accordance with the instructions of the responsible person on proper/safe manipulation with it.
2) Used IR generators must be properly labelled with a label and a hazard sign warning against invisible ionising radiation. Each IR generator must be equipped with a signalling system and automated blocking system.
3) When working with IR, exposure to IR as well as contamination of persons by radioactive substances must be minimised using the available technical means and appropriate organisation of work. First of all, sufficient shielding of IR sources must be ensured using lead or concrete screens, boxes or storage containers.
4) In case a supervised area is delimited, the head of laboratory in collaboration with the Supervising person must define the individual requirements on working regimes measures in the area, which must be strictly adhered to.
5) When working with IR sources, appropriate PPE must be used (eg lead aprons, shields, gloves) and work with the IR sources must be optimised to ensure adherence to radiation limits for exposed workers at 20 mSv/year.
6) Only persons who have been authorised to perform the above activities by the person responsible for the operation of the facility ('authorised persons') may work independently with IR sources that emit harmful radiation into the open space. These are usually academic and research workers or students in Doctoral study programmes who carry out scientific or other specialised activities there. Students performing practical exercises may work with this NIR source only under the supervision of the person acting as a supervisor[2].
7) Before starting work with an IR source, each person must be properly familiarised with:
    - this Directive,
    - potential risks linked to using the given IR source,
    - safe working procedures and instructions to use the given IR source,
    - prohibited activities,
    - requirements on PPE when working with IR sources and instructions on their safe use,
    - direct and indirect effects of ionising radiation on health and how to identify them (acute and chronic effects),
    - procedures in case an extraordinary event should occur (first aid, telephone numbers to call for help, fault reporting).

[2] A teacher (ie the head of the practical or substitute teacher) or a UCT employee authorised by them, or a student in a Doctoral study programme enrolled in studies at UCT Prague who is qualified to work with the given IR generator can act as the person acting as a supervisor

This information is provided by the Supervising person or the persons directly supervising radiation protection. The knowledge acquired by the trainees is tested by a written test that will be stored for archival purposes.

8) At the workplaces where unsealed radionuclide sources are handled, decontamination means in the required scope and amount must be available. Procedures for decontamination of persons, work surfaces and tools will be defined by the Supervising person.

9) Instructions on performance of activities involving radiation are given in Directive A/S/961/2/2025.

Article VII

Person supervising radiation protection

1) The person supervising radiation protection (hereinafter as the 'Supervising person') is responsible for continuous surveillance of radiation protection at all UCT Prague workplaces where sources of ionising radiation are handled under the Atomic Act and Decree No. 422/2016 Coll.

2) Only an employee with a specific professional qualification and an authorisation for the performance of activities of particular relevance to radiation granted by SUJB who has been authorised to perform this role by the rector pursuant to Art. 8, Para 1, letter b) of internal standard No. A/N/961/1/2025 can be appointed Supervising person.

3) The Supervising person monitors and evaluates fulfilment of obligations of UCT Prague in connection with:

   - safe handling of sources of ionising radiation and nuclear materials,
   - carrying out activities involving radiation,
   - ensuring the safe operation of the workplace where activities involving radiation are carried out,
   - handling of radioactive waste,
   - decommissioning of the workplace where activities involving radiation are carried out.

4) The Supervising person is obliged to:

   - inform exposed workers and persons preparing to perform their profession in the supervised area about facts important in relation to radiation protection,
   - continuously educate exposed workers,
   - carry out monitoring and evaluation of monitoring results according to the monitoring programme,
   - record personal doses, including the sum of personal doses from all work activities of exposed workers,
   - carry out optimisation of radiation protection and determination of dose optimisation limits,
   - maintain documentation for the permitted activity,
   - carry out evaluation of the method of ensuring radiation protection,

- carry out annual inventory checks of sources of ionising radiation,
- organise acceptance testing and long-term stability testing,
- carry out operational stability tests of sources of ionising radiation
- investigate radiation extraordinary events, losses, theft or damage to sources of ionising radiation and develop proposals for the adoption of corrective measures and control the implementation of corrective measures,
- monitor and resolve non-conformities that are not radiation extraordinary events in the field of radiation protection,
- supervise the provision of occupational health services to exposed workers,
- communicate promptly with exposed workers and other persons, if consultation with them is necessary with regard to the current radiation situation, in such a way that information is communicated clearly, understandably and without unnecessary delay,
- methodically guide persons entrusted with direct supervision of radiation protection and coordinate their activities.

5) The Supervising person is authorised to:

- to designate in writing the persons responsible for performing direct supervision of radiation protection within the scope of Section 44 of Decree No. 422/2016 Coll. for workplaces where radiation activities requiring the delimitation of a supervised area are carried out,
- to check compliance with the specified technical and organisational measures by employees and to issue binding instructions to employees to ensure radiation protection,
- to issue an order to immediately stop the performance of activities involving radiation in the event of a serious breach of obligations in the field of radiation protection,
- to permanently or temporarily exclude an employee from the workplace where sources of ionising radiation are handled, in the event of failure to comply with their obligations in the field of radiation protection.

Article VIII

Monitoring programme for workplaces with radionuclide sources of ionising radiation

1) Monitoring serves to check the current radiation situation, prevent and timely detect extraordinary events. The monitoring programme includes monitoring of workplaces where the Supervised area is delimited.

2) At UCT Prague it is allowed to handle unsealed radionuclide sources licensed by SUJB only at workplaces registered by SUJB and only for research and scientific purposes. Other modes of handling with radionuclide sources are strictly prohibited.

3) The aims of the performed monitoring include:

- Ensuring the protection of exposed workers and other persons.
- Inspection of ionising radiation sources and their safe use.
- Fulfilment of SUJB requirements for radiation protection and emergency

preparedness.
- Monitoring of leakages of radionuclides into the environment.

4) Monitoring of workplaces where work is performed with radionuclide sources is carried out in compliance with the Monitoring programme approved by SUJB.

5) The person directly supervising radiation protection who carries out monitoring by measuring surface contamination will evaluate the results of the measurement and make a written record of the measurement. The measurement is performed by reading the surface contamination value on the scale of the used instrument. Measurement records are kept by the responsible person and archived for 10 years.

6) The evaluation of the measurement results is done by comparison with monitoring levels. The values of the monitoring levels and measures taken in case of exceeding the levels are given in the table below.

Monitoring levels of surface contamination [Bq/cm^2]*	
recording and investigation	0.3
intervention	0.4

* the levels are given after background correction

In case monitoring levels are exceeded, the Supervising person must be informed and measures must be taken:

- recording level – a written record of the level will be made,
- investigation level – the cause will be investigated and the effects of the increased surface contamination will be ascertained,
- intervention level – measures to remedy the situation will be taken to prevent undesired developments of the situation.

If contamination of a workplace is detected, decontamination in accordance with the defined procedures and instructions must be carried out without delay.

7) Individual monitoring of exposed workers is carried out to determine personal effective doses of external irradiation of exposed workers.

- Individual monitoring of category B exposed workers is ensured according to Section 72, Para 1, letter c) of Decree No. 422/2016 Coll. by equipping one or more category B exposed workers performing the same work activity at the same workplace with a personal film dosimeter with a monthly monitoring period and assigning the personal dose obtained by its evaluation to other exposed workers without a personal dosimeter at this workplace.
- Exposed workers are required to wear a film dosimeter for the entire period when they could be exposed to IR. Dosimeters are worn attached to the outside of work clothes on the front left side of the chest. When using a protective shielding apron, the personal dosimeter must be placed outside this apron.
- If contamination of persons is suspected, an inspection will be carried out using a surface contamination meter without delay.

8) Dose constraints are defined by the Supervising person and set as individual effective doses for relevant workers. These doses are estimated and planned in advance and after work they are evaluated and adjusted for further activities. Dose constraints are the same for permanent exposed workers (employees) and other workers (students).

Adherence to dose constraints is monitored by the Supervising person and is evaluated once a year. In case of inadequate setting, the dose constraints will be optimised. Dose constraints are set at 0.25 mSv/year for general public and at 3 mSv/year for exposed workers.

9) Due to the character of the work and used radionuclides, it is not necessary to monitor the surrounding areas.

Article IX

Long-term stability testing of sources of ionising radiation

1) Acceptance testing is done to evaluate the properties of sources of ionising radiation.
2) Acceptance testing must be done after the installation of a source of ionising radiation and before it is used.
3) Acceptance testing and long-term stability testing are not required for insignificant or small sources of ionising radiation that are not sources of ionising radiation for non-medical exposure, sealed radionuclide sources for which no more than 6 months have passed since they were manufactured, or sources of ionising radiation accepted exclusively for storage, transport or distribution, sources of ionising radiation manufactured by their user for their own use, prototypes or unique equipment.
4) Acceptance testing must include:
    - visual inspection of the integrity and undamaged nature of the source of ionising radiation,
    - in case of an unsealed radionuclide source, verification of the data specified in the accompanying document for the open radionuclide source issued by the manufacturer,
    - in case of a sealed radionuclide source:
        - verification of the data specified in the certificate of the sealed radionuclide source and
        - leak test, including determination of measurement uncertainty,
    - in case of equipment with sealed radionuclide source:
        - verification of the functionality of the equipment with a sealed radionuclide source,
        - verification of the functionality of the control, monitoring, safety, signalling and indication systems,
        - verification of the operating parameters and properties of the equipment with a sealed radionuclide source,
        - determination of dosimetric quantities important in relation to the purpose of use of this equipment; in case of radiotherapy, including their uncertainties,
        - testing the tightness of the sealed radionuclide source by abrasion testing on a replacement surface, including determination of measurement uncertainty,
        - measurement or estimation of useless radiation in the vicinity of the device with a sealed radionuclide source
    - in case of a radiation generator:
        - verification of the functionality of the radiation generator,

- verification of the functionality of the control, operating, safety, signalling, indication and display systems,
- verification of the operating parameters and properties of the radiation generator,
- determination of dosimetric quantities important in relation to the purpose of use of the radiation generator; in case of radiotherapy, including their uncertainties, and
- measurement of useless radiation in the vicinity of the radiation generator or its estimation in case of dental intraoral or dental panoramic X-ray equipment, and
- verification of the data from the manufacturer that is significant for the possible use of the equipment from in relation to radiation protection, or if this verification cannot be carried out in standard operating mode, checking that the verification of this data was carried out by the person who installed the source of ionising radiation.

5) Acceptance testing and long-term stability testing is organised by the Supervising person in collaboration with the person that carries out the tests.

6) Unless provided otherwise in the user's manual of the manufacturer of the equipment that uses a sealed IR source, these IR sources (eg scanning electron microscope SEM, PC tomography, X-ray diffraction, EC detector for gas chromatography etc) must be replaced in accordance with the instructions of the Supervising person.

Article X

Prohibited activities when using sources of harmful radiation

1) When using NIR sources, it is prohibited in particular to:

- Remove covers from the NIR source, interfere with its construction (especially electrical and optical parts).
- Manipulate with the NIR source and adjust it using force or in a rough manner.
- Look directly into the transmitted or reflected laser beam/UV radiation during operation of the NIR source.
- Place objects in the path of the laser beam (except for approved measuring tools) that could cause unwanted reflections of the beam into the area intended for operation.
- Work with the NIR source without proper prior instruction by the responsible person or in a manner that is in breach of this document or the instructions of the responsible person (or persons performing supervision).
- Allow unauthorised persons to enter the room where the NIR source is used or leave them there without supervision by an authorised person.

2) When using IR sources, it is prohibited in particular to:

- Remove covers from the IR source, interfere with its construction.
- Manipulate with the IR source and adjust it using force or in a rough manner.
- Work with the IR source without proper prior instruction by the responsible person

or in a manner that is in breach of this document or the instructions of the responsible person (or persons performing supervision).
- Allow unauthorised persons to enter the room where the NIR source is used or leave them there without supervision by an authorised person.
- Take a radionuclide source of a higher than insignificant category outside the supervised area without the consent of the Supervising person or the Person directly supervising radiation protection.

Article XI

Register of sources of harmful radiation

1) All IR and NIR sources operated at UCT Prague workplaces, with the exception of class 1, 2 and 3R lasers, are subject to registration. The register will include the following information:
   - Name or other designation of the source of harmful radiation.
   - Location of the source (building, room number).
   - Name of the person responsible for operating the source.
   - Name of the manufacturer, serial number and year of manufacture of the source.
   - Other operational and technical data about the source (eg laser class, working medium, output power etc).
2) The Department of Safety and Risk Prevention keeps the central register of sources of harmful radiation through selected persons appointed by the rector (ie the chief Supervising person, or the head of registration of NIR sources).
3) Each organisational unit of UCT Prague is obliged to report to the Department of Safety and Risk Prevention all sources of harmful radiation used at its workplaces within 30 days after this Directive comes into force. Newly acquired sources must be reported without unnecessary delay so that potential health risks can be assessed and appropriate safety measures adopted before they are put to operation.
4) IR sources for the operation of which a licence or permission by SUJB is required can be acquired and used only after all legal requirements and measures to minimise exposure of natural persons and protect the environment against IR effects are met and in accordance with the instructions of the Supervising person.
5) The inventory inspection of sources of ionising radiation is performed once a year by 31 March and it is performed by the Supervising person. The Supervising person will keep records of the performed inventory inspection of IR sources and they will hand over a copy thereof to the Department of Safety and Risk Prevention.

Article XII

Extraordinary events

1) An extraordinary event related to the use of sources of harmful radiation refers in particular to:
   - radiation extraordinary event, ie an event that leads or may lead to exceeding

exposure limits, and which requires measures to prevent the exceeding of the limits or deterioration of the situation from the point of view of ensuring radiation protection,

- leakage of radioactive material or contamination of work surfaces, equipment, clothing or persons,
- loss or theft of an IR source,
- damage to an IR/NIR source that could lead to other serious consequences except for exposure of persons (eg fire, explosion, HSM leak),
- exceeding the maximum permissible value of NIR for a one-off occupational exposure of a person to UV radiation,
- hitting the eye or skin of a person with a direct laser beam emitted by a class 3B or class 4 laser,
- accidental exposure to harmful radiation of other persons (ie students, visitors, cleaning or maintenance workers etc).

2) Loss or theft of an IR source must be reported to the Police of the Czech Republic and SUJB, and the Supervising person and the head of the Department of Safety and Risk Prevention must be informed about it.

3) In case a serious violation of obligations of persons related to radiation protection occurs at a given workplace, or in case activities involving radiation are carried out by an unauthorised person, the Supervising person must issue an order to immediately halt all performed activities or expel the given person from the workplace where an IR source is handled.

4) In case an extraordinary event occurs, every measure to prevent deterioration of the potential effects must be taken, in particular first aid must be given to the affected person or they must be decontaminated in case they have been exposed to a radioactive substance. All extraordinary events during which a person has been contaminated externally or internally must be reported to the Emergency Medical Service.

5) After each extraordinary event, its causes or the circumstances that led to it must be investigated without delay, the extent of the consequences must be determined and, based on these findings, a proposal for corrective measures must be developed to prevent its recurrence. The investigation of the extraordinary event is carried out by the head of the workplace where the accident occurred in collaboration with the OHS and FP specialists (Department of Safety and Risk Prevention), the Supervising person and possibly other invited experts. A written report from the investigation is prepared, which is presented to the management of UCT Prague and the relevant state authorities in accordance with applicable laws, if applicable.

6) The inspection of the implementation of the set corrective measures is carried out by the Department of Safety and Risk Prevention.

Article XIII

Final provisions

1) This document comes into effect on the day it is signed and it comes into force on the day it is issued.
2) Heads of organisational units must ensure that their subordinate employees working with IR/NIR sources are familiarised with this document and will continuously require their compliance with it.

Prof. Ing. Milan Pospíšil, CSc., m. p.
Rector