

Radiation Protection Instruction for Heidelberg University^{*)}

on enforcement of the Act on Protection against the Harmful Effects of Ionising Radiation (*Gesetz zum Schutz vor der schädlichen Wirkung ionisierender Strahlung*; Radiation Protection Act – StrlSchG) of 27 June 2017 (BGBl. I p. 1966), last amended by announcement of 3 January 2022 (BGBl. I p. 15) and the Ordinance on Protection against the Harmful Effects of Ionising Radiation (*Verordnung zum Schutz vor der schädlichen Wirkung ionisierender Strahlung*; Radiation Protection Ordinance – StrlSchV) of 29 November 2018 (BGBl. I p. 2034, 2036; 2021 I p. 5261), last amended by Article 1 of the Ordinance of 8 October 2021 (BGBl. I p. 4645).

This radiation protection instruction stipulates:

- handling of other radioactive substances, operation of X-ray equipment and stray radiation emitters at Heidelberg University (cf. §§ 12 & 19 StrlSchG),
- employment of members and affiliates of Heidelberg University in external facilities (cf. § 25 StrlSchG) and transport of radioactive substances (cf. § 27 StrlSchG),
- compliance with principles of radiation protection, organisation of radiation protection at Heidelberg University, and implementation of any legally required measures to maintain safe operations at Heidelberg University,

and is supplemented by:

- annexes¹,
- local or application-specific Radiation Protection Instructions² to specify the provisions of these Radiation Protection Instructions in light of proper and safe operation.

¹ Annexes to these radiation protection instructions for Heidelberg University contain regulations that are subject to regular updates. The annexes are provided digitally within Heidelberg University; statutory posting requirements must be observed.

² Local and application-specific radiation protection instructions stipulate local and application-specific special features that are not covered by this radiation protection instruction. Local and application-specific radiation protection instructions are provided digitally within Heidelberg University; statutory posting requirements must be observed.

^{*)} This English translation is provided for informational purposes only; the German version shall solely be binding.

1. Introduction

Operation of X-ray systems and interference emitters as well as handling of radioactive substances may cause a risk of external exposure and, when handling open radioactive substances, a risk of incorporation with a potential danger to the life and health of the members or affiliates of Heidelberg University or third parties at improper use.

All necessary technical and organisational measures must, therefore, be implemented and complied with at all times so that

- the limit values for occupationally exposed persons in accordance with § 78 StrlSchG and for the general public in accordance with § 80 StrlSchG are not exceeded, as well as that
- any unnecessary exposures are avoided and
- any unavoidable exposures are minimised.

2. Legal basis and approvals, scope of application

These Radiation Protection Instructions are based on

- § 73 StrlSchV in conjunction with. § 45 StrlSchV and
- the approvals issued to Heidelberg University
(*cf. Annex 1 – Overview of Authorisations*).

Unless otherwise stipulated in the StrlSchZuVO³ the responsible approval authority is:

*Regional Council Karlsruhe^{a)}
Department 54.5 – Radiation Protection
D-76247 Karlsruhe*

³ Ordinance of the State Government and the Ministry of the Environment, the Ministry of the Interior, the Ministry of Social Affairs, the Ministry of Rural Areas, and the Ministry of Transport on the responsibilities for radiation protection matters (Verordnung der Landesregierung und des Umweltministeriums, des Innenministeriums, des Sozialministeriums, des Ministeriums Ländlicher Raum und des Verkehrsministeriums über die Zuständigkeiten für Angelegenheiten des Strahlenschutzes - StrlSchZuVO), as amended

^{a)} Regierungspräsidium Karlsruhe, Referat 54.5 – Strahlenschutz, D-76247 Karlsruhe

These Radiation Protection Instructions apply to

*Heidelberg University – Corporation under public law
Grabengasse 1
D-69117 Heidelberg*

- hereinafter: Heidelberg University -

The material scope refers to the handling of other radioactive substances and the operation of X-ray equipment and interference emitters at Heidelberg University.

Members and affiliates of Heidelberg University who perform any relevant activities in accordance with StrlSchG must strictly comply with these Radiation Protection Instructions.

3. Organisation of radiation protection

The party responsible for radiation protection is:

*Heidelberg University – Corporation under public law
Grabengasse 1
D-69117 Heidelberg*

- hereinafter: the SSV -

The obligations and powers of the party responsible for radiation protection are defined in §§ 69, 71 & 72 StrlSchG and in the StrlSchV.

The tasks of the SSV shall be performed by the person authorised to represent the SSV – the Rector of Heidelberg University – in accordance with § 69 (2) StrlSchG.

The radiation protection supervisor (SSV) shall

- i. be responsible for the organisation of operational radiation protection at Heidelberg University.
- ii. ensure compliance with legal tasks and obligations in accordance with StrlSchG and StrlSchV at Heidelberg University.
- iii. issue the Radiation Protection Instructions of Heidelberg University.

- iv. appoint suitable radiation protection officers (in accordance with § 70 (1) StrlSchG), defines their internal decision-making areas, tasks, and powers required for them to perform their tasks in writing (in accordance with § 70 (2) StrlSchG), and supervises the radiation protection officers.
- v. ensure provision of the budgetary resources required for radiation protection within the framework of financial planning.

If they do not wish to perform the necessary operational instructions and decisions and the tasks as SSV directly, they may appoint radiation protection commissioners to perform their statutory tasks; these shall perform interface tasks with the radiation protection officers and are equipped with the necessary internal skills.

The SSV shall enforce internal implementation of the StrlSchG and StrlSchV at Heidelberg University via the radiation protection commissioners and the radiation protection officers.

The SSV shall inform the radiation protection officers of any administrative acts and measures relating to the guarantee of radiation protection without undue delay through the radiation protection commissioners.

Delegation of the execution of the tasks and independent performance by the radiation protection commissioners and the radiation protection officers serves to relieve the SSV. However, the SSV shall remain responsible for compliance with the obligations imposed on them by the StrlSchG and StrlSchV. The SSV of Heidelberg University is, therefore, responsible for implementing the rules and regulations described in the StrlSchG and StrlSchV and for ensuring compliance with them.

The person authorised to represent the SSV is named in “Annex 2 – Radiation Protection Organisation of Heidelberg University”.

Radiation protection commissioner (*Strahlenschutzbevollmächtigter*; SSBev)

The SSV may assign the tasks arising for them from the current legal situation and the decision-making authority required for compliance with these in their internal decision-making area to one or several radiation protection commissioners (hereinafter: SSBev).⁴ The responsibility, supervisory rights, and supervisory obligations of the SSV shall remain unaffected. The appointment as SSBev shall be made in writing; it shall continue for an indefinite period and is revocable. The SSV shall notify the responsible approval and supervisory authority of the appointment. The personnel administration and staff council shall receive a copy of the order letter each. The function as SSBev must be specified in the job description with a sufficient time allocation.

The SSBev should have a degree in natural sciences or engineering and be specialised in radiation protection. The SSBev(s) utilise the assistance of the university administration and the departments and facilities of Heidelberg University for their administrative tasks, based on their responsibilities.

The SSBev(s) of Heidelberg University and their contact details are listed in “Annex 2 – Radiation Protection Organisation of UHD”.

The radiation protection commissioners shall

- i. perform all tasks specified in their written appointments on behalf of the SSV. The powers and responsibilities of a radiation protection officer in their respective area of competence and decision-making shall remain unaffected by the appointment of an SSBev.
- ii. have direct authority to issue instructions and orders to all facilities and persons within the scope of this Radiation Protection Instruction for the purpose of implementing the StrlSchG and StrlSchV; the authority to issue instructions shall extend in particular to the radiation protection officer(s), provided that the SSBev is/are competent. The SSBev(s) are directly subordinate to the SSV in matters of radiation protection and shall be bound by the SSV’s instructions only. Everyone is obligated to provide them with information on radiation protection issues.

⁴ cf. BT-Drs. 118/11241, p. 313 et seq.

The above authority to issue instructions and orders shall include the right to perform regular inspections, checks, review of the records to be kept in accordance with the StrlSchG and StrlSchV, compliance with the conditions imposed by public authorities, plans, radiation protection areas, etc., as well as notification and reporting to the SSV.

- iii. support and advise the SSV in all matters referring to radiation protection. They are obligated to submit periodic reports to them in this context.
- iv. advise the departments and facilities in their areas of responsibility, as well as the staff council, on radiation protection matters.
- v. ensure that the principles of radiation protection are observed, under consideration of the scientific and technical state of the art for protection of humans and, as far as the long-term protection of human health is concerned, the environment from the harmful effects of ionising radiation.
- vi. coordinate radiation protection in the respective areas of responsibility assigned to them, support the radiation protection officers in regulating operational procedures, and assume superordinate functions in coordination with them. Decisions shall be made by the SSV if there is any doubt.
- vii. handle correspondence with the public authorities.
- viii. be informed by the relevant departments of the university administration or by the university's institutes and facilities of any construction and investment projects that are subject to the StrlSchG; they must be involved in radiation protection planning.
- ix. monitor and coordinate the personal dosimetry organised by the radiation protection officers and the medical examinations of any occupationally exposed persons concerned.
- x. maintain the inventory of open and sealed radioactive substances and the inventory of X-ray equipment and interference radiators.
- xi. be informed of any significant incidents (see section 16) and be involved in the coordination of appropriate measures.
- xii. propose selected persons for appointment as radiation protection officers to the SSV, if necessary following prior coordination with the direct superiors of the respective departments or the directors of the university's institutes and facilities. Following

approval by the SSV, the SSBev(s) shall notify the competent public authority of the appointments, including any changes to the radiation protection organisation. The HR department and the Staff Council shall be informed of the appointment in writing; the participation rights of the staff council must be considered.

- xiii. maintain a list of all appointed radiation protection officers and keep a record of the specialist training courses completed and the updating of the specialist knowledge of all radiation protection officers. The SSBev(s) shall inform the HR department annually about the specialised training courses completed.

Deputy for the radiation protection commissioners

The SSBev must appoint at least one permanent deputy for the SSBevs. This appointment shall be made in accordance with the appointment of SSBevs. All tasks, rights, and obligations shall be transferred to the deputy accordingly during the absence of the SSBev.

The deputies of the SSBev of Heidelberg University are named in “Annex 2 – Radiation Protection Organisation of UHD”.

Radiation protection officers (*Strahlenschutzbeauftragte*; SSB)

Radiation protection officers (hereinafter: SSB) manage and supervise activities to ensure radiation protection when handling radioactive substances or ionising radiation.

The SSV shall appoint the required number of radiation protection officers upon the suggestion of the SSBev(s). All activities requiring approval within the meaning of §§ 12, 19, 25 & 27 StrlSchG must be covered by the area of responsibility of an SSB.

An SSB shall be appointed in writing for an indefinite period; appointment is revocable. The letter of appointment must define the tasks, powers, and internal decision-making area of the respective SSB. This is described:

- organisationally or spatially,
and

- via the official position,
or

if the powers are not derived from the official position, by the appointment.

Prior to appointment, the SSV must ensure that the persons to be appointed comply with the personal and professional requirements in accordance with § 70 StrlSchG. This must be verified by the SSBev in advance. The function as SSB must be specified in the job description with a sufficient time allocation.

The SSBs of Heidelberg University and their contact details are listed in “Annex 2- Radiation Protection Organisation of UHD”.

Availability of radiation protection officers outside operating hours must be regulated in the local Radiation Protection Instructions.

The radiation protection officers shall

- i. perform all tasks and functions in their internal decision-making areas that are assigned to them in accordance with the StrlSchG, the StrlSchV, this Radiation Protection Instruction, and their appointment.
- ii. be responsible for compliance with legal and operational radiation protection regulations and for implementation and enforcement of the necessary radiation protection measures as well as compliance with any licensing requirements in their respective decision-making areas.
- iii. have supervisory authority in their respective areas of responsibility and are authorised to issue instructions. This shall include the right to enter rooms within their respective area of responsibility at any time and without any further authorisation, to inspect documents, and to issue instructions as far as this is necessary to perform their obligations as SSB.

In particular, the SSB shall have the right to order immediate measures to avert danger. They must inform the SSV and SSBev of any measures they have taken in writing without undue delay.

- iv. have the right to request information from and issue instructions to anyone regarding radiation protection matters in the respective decision-making area assigned to them.
- v. keep their deputies and the SSBev informed about any relevant processes in their respective areas in writing, continuously and comprehensively, without prompting. This shall in particular include any transactions that require authorisation from and/or notification of the competent public authority as well as any notification obligations subject to the applicable regulations. The SSB must inform the SSBev of any changes required to their respective internal decision-making area in writing without undue delay.

- vi report on operations in the decision-making area assigned to them annually.
- vii. be obligated to inform the SSBev without undue delay if they are no longer able to perform their obligations.
- viii. inform the SSBev of any defects and significant changes that affect radiation protection in writing without undue delay. If the SSBs cannot reach an agreement with the SSBev on any radiation protection measure proposed by them, the SSBev shall submit the proposal to the SSV in writing for a decision.
If the proposal is rejected there as well, the SSV must inform the SSB of the rejection of the proposal in writing, stating reasons, and submit a copy to the staff council and the competent public authority.
- ix. keep an operating log in which they enter the operating procedures that are essential for radiation protection (see section 18) and monitor any entries made by users.
- x. report any significant incidents (see section 16) to the supervisory authority via the SSV or the SSBev without undue delay. They shall perform radiation protection measures in the event of faults, accidents, and significant incidents and advise emergency services.
- xi. draw up special local radiation protection and work instructions for their respective area of responsibility, including details of the radiation protection areas, relevant access regulations, marking, employment bans, and restrictions for their respective area of responsibility. Such local radiation protection and work instructions must be drawn up based on the StrlSchG, the StrlSchV, and these Radiation Protection Instructions, and must be published in a timely manner by posting or displaying them. In the long term, they shall be incorporated into these Radiation Protection Instructions and published in the Heidelberg University Gazette.
- xii. monitor the functionality of any devices and systems that are essential for radiation protection. They shall be responsible for the proper condition of the equipment required for radiation protection. Calibration and testing deadlines for the corresponding measuring devices must be observed. They shall organise the maintenance and, if necessary, repair of such devices.
- xiii. apply for and update the necessary approvals or notifications for operation in their respective areas of responsibility via the SSBev.
- xiv. be obligated to ensure that personal dosimetry is performed properly in their respective areas of responsibility and shall

monitor compliance with the limit values. They are also responsible for proper use and timely replacement of any personal dosimeters for everyone to be monitored in their respective area of responsibility.

- xv. arrange for dosimetry monitoring of any other persons if necessary and unregister persons from monitoring if necessary. The specialised procedure defined by Heidelberg University shall be used for this purpose.
- xvi. ensure that the occupational radiation exposure of pregnant women in their respective area of responsibility is determined every working week immediately after becoming aware of the pregnancy of a woman subject to personal dosimetry monitoring.
- xvii. ensure that a copy of the relevant approval, the Radiation Protection Instructions as amended (both these and any local ones), as well as any issued work instructions and the Radiation Protection Act with its ordinances are available for inspection by users at each handling location at all times.

Deputy of the radiation protection officers

One deputy generally must be appointed for each SSB; further deputies may be appointed if necessary.

Deputy rules in the absence of the SSB(s) during approved activities or during operation of an approved installation on site must be clearly stipulated. All obligations and powers shall be transferred to the respective deputy accordingly during the absence of the SSB.

This appointment shall be made in accordance with the appointment of the SSB.

Appointment of a deputy is not necessary if the SSB is the only user in their respective area at the same time.

If the SSB and their deputy are prevented from attending at the same time, the approved activities must be suspended until an SSB appointed for the respective area is on site. Any deviating regulations must be stipulated in the local Radiation Protection Instructions in writing.

The deputies of the SSBs of Heidelberg University and their contact details are listed in “Annex 2– Radiation Protection Organisation of UHD”.

4. Signature rules

1. The SSV shall sign approval requests and processes of particular relevance *in their own name*. In the absence of the Rector, transactions subject to deadlines may be signed by a member of the rectorate who is authorised to represent the Rector (see rules of procedure of the rectorate of Heidelberg University) by proxy (*in Vertretung*).
2. The SSBev shall sign the regular correspondence with the supervisory and approval authority on behalf (*im Auftrag*). In the absence of the SSBev, their deputy shall sign by proxy (*in Vertretung*).
3. The dispatch of (mandatory) notifications shall be performed by department 2.3 - Radiation Protection of CENTRAL SERVICES Neuenheimer Feld.

Any urgent notifications or reports in the case of incidents and exceptional operating conditions (see section 13) shall be submitted by the competent SSB on behalf (*im Auftrag*) without undue delay; the notification must be recorded. Such notifications must be forwarded to the SSV and the SSBev immediately thereafter.

If suitable, the documents may be sent digitally; suitable specialised procedures must be used. In particular, the integrity, confidentiality, and availability of the information to be transmitted must be guaranteed.

5. Reporting obligations

The competent SSBs shall report on operations in their respective internal decision-making areas regularly in writing by 15 March of the respective calendar year. These reports are to be submitted to the SSBev via the department 2.3 - Radiation Protection of CENTRAL SERVICES Neuenheimer Feld.

The SSBev shall report on the current status of radiation protection at Heidelberg University to the SSV regularly by 30 April of the respective calendar year.

6. Radiation protection areas and access rules

The access points to any radiation protection areas must be marked with radiation signs⁵.

Please refer to the local or activity-specific radiation protection instructions for access rights to the individual areas.⁶

7. Inspections

The university's radiation protection areas must be inspected periodically (handling and storage areas for open other radioactive substances typically once per year, any other radiation protection areas typically every two years) on behalf of the SSV.

The inspection dates shall be scheduled upon the suggestion of the SSBev and must be announced by 15 November of the respectively preceding year. Unannounced or ad-hoc inspections may be scheduled by the SSV or the SSBev at any time.

The inspections shall be organised by the department 2.3 – Radiation Protection of CENTRAL SERVICES Neuenheimer Feld; if necessary, other specialist departments and/or representatives of the university administration may be involved in such inspections. The results of these inspections must be brought to the attention of the SSV.

8. Instruction⁷

Persons who work within the scope of an activity that must be notified or authorised or who are permitted access to controlled areas must be instructed in accordance with § 63 StrlSchV prior to their first access. Persons who handle any radioactive substances or who use any ionising radiation outside of any controlled areas based on approvals must be instructed before commencing such work for the first time.

Persons working with any radiation sources must be instructed in accordance with § 98 StrlSchV.

These Radiation Protection Instructions and any other applicable

⁵ cf. on this: §§ 53 & 91 StrlSchV, as well as DIN 25430 – Safety marking in radiation protection

⁶ cf. on this Annex 3 - Access Rules

⁷ cf. on this Annex 4 – Instruction Template

instructions must be included in the instruction.

The instruction must be given orally. The instruction must be given in a form and language that is comprehensible to the persons being instructed. It must be repeated annually or at shorter intervals upon the competent public authority's request. Records must be kept regarding the content and time of the instruction; they must be signed by the instructed person and the instruction records must be stored by the competent SSB.

Women must receive the following instructions in accordance with the StrlSchV and the company's internal organisation:

1. In light of the radiation risk to the unborn child, any pregnancy must be reported to the competent SSB or their deputy at the earliest possible point of time.
2. Infants may incorporate radioactive substances from breastfeeding in cases of contamination.

Other persons who are permitted to access the controlled area based on an official authorisation must be instructed regarding potential hazards and on how to avoid them in accordance with § 63 (4) StrlSchV before entering the respective area.

This instruction may be part of other required instructions, in particular in accordance with any regulations on occupational safety and health, emission control, hazardous goods, or hazardous substances.

9. Body dose determination

Personal data must be collected for the legally required body dose determinations.⁸ The processing and use of personal data refers to the communication of the personal data of the dosimetrically monitored persons to the officially designated measuring centre and, if applicable, to the competent public authority as well as entry of the transmitted data in the radiation protection register at the Federal Office for Radiation Protection. Personal dosimetry monitoring data are assigned to the person in the register office or at the measuring point using the SSR number.⁹

Persons subject to dosimetry monitoring have the right to obtain information on the data stored about them (via their personal SSR number¹⁰).

⁸ The SSR number, last name, first name(s), date and place of birth, and gender shall be processed to determine the body dose.

⁹ The national insurance number, last name, first name(s), maiden name, date and place of birth, and, if applicable, nationality are collected and processed for the application for an SSR number for initial registration with the BfS Radiation Protection Register.

¹⁰ SSR: Strahlenschutzregister (Radiation Protection Register)

The person concerned must tolerate measurements and findings for body dose determination.

The body dose for external exposure generally is determined by measuring the personal dose.

The personal dose may be determined from local dose measurements, local dose rate measurements, measurements of the concentration in the air or the contamination of the workplace following approval by the competent public authority under certain exposure conditions (e.g., external and internal exposure). Local dose measurement can be used to ensure proper operation in the training laboratories in particular.

Body activity or excretion activity will be measured in cases of internal exposure monitoring.

Persons who have worked as an occupationally exposed person in radiation protection areas outside of Heidelberg University must submit certificates from their previous place of employment or their radiation passport before taking up work.

Occupational exposure must be determined on a weekly basis as soon as the employer is informed of a pregnancy. The employee must be informed of the results. Internal occupational exposure must be excluded. Misuse of personal dosimeters (e.g., wilful irradiation) is prohibited.

The SSBev of Heidelberg University and the competent SSB must be informed without undue delay if any dosimeter is lost. They shall determine the further procedure (e.g., issuing a replacement dosimeter, determination a replacement dose). The employee must not work in the radiation protection area again before the decision has been made.

The competent public authority shall be informed by the SSBev, and the dose shall be estimated by the competent SSB in coordination with the SSBev, if any measurements are omitted or performed incorrectly.

The results of the personal dosimetry monitoring must be documented by the SSB and any conspicuous measured values must be discussed with the employee.

Special application-related provisions can be found in the local or application-specific Radiation Protection Instructions.

External exposure

The body doses of persons in a radiation protection area must be determined. Exceptions are detailed in § 64 StrlSchV. The body dose is to be determined by measuring the personal dose using an official dosimeter provided by the responsible measuring centre in accordance with § 169 (1) StrlSchG.

Official dosimeters are personalised. The dosimeter must be constantly positioned at the body surface area representative of the exposure (usually: top of the torso) during the activity.

The official dosimeters must be handed over to the person responsible for personal dosimetry – usually the locally appointed SSB – in cases of prolonged absence (e.g., leave times).

Any personal dosimetry conditions imposed in the scope of any approval procedures or downstream legal acts must be implemented by the competent SSB(s) without undue delay. Such measures must be specified in the local or application-specific Radiation Protection Instructions for each area.

Use of dosimeters that can be read at any time

The institutes and facilities of Heidelberg University may request electronic dosimeters that can be read at any time; their use must be coordinated with the department 2.3 - Radiation Protection of CENTRAL SERVICES Neuenheimer Feld and the dosimeters must be requested from there.

Professionally exposed external personnel

If any external personnel are deployed on behalf of Heidelberg University, they must be equipped with dosimeters that can be read at any time. Documentation is to be handed over to the department 2.3 - Radiation Protection of CENTRAL SERVICES Neuenheimer Feld for further processing.

The values of directly readable dosimeters must be recorded in writing per working day and submitted to the department 2.3 - Radiation Protection of CENTRAL SERVICES Neuenheimer Feld every week. The competent SSB and the department 2.3 - Radiation Protection of

CENTRAL SERVICES Neuenheimer Feld must be informed without undue delay if any increased exposure [> 0.025 mSv] is found.

Internal exposure

Body activity or excretion measurements must be performed in coordination between the competent SSB and the authorised doctor to monitor internal exposure.

Extraordinary events or relevant occurrences

Body doses shall be determined if any relevant incident in accordance with section 16 occurs. Both internal and external exposure may play a role here.

10. Operational dose reference values

Determination of dose reference values is not considered a suitable instrument for further optimisation of radiation protection due to the general effective dose to be expected at the Heidelberg University at < 1.2 mSv per year (effective dose). Accordingly, no additional dose reference values are specified in accordance with § 72 StrlSchV.

Records for the corresponding monitoring (evaluation of personal dosimetry) may be viewed at the competent SSB. Review of the introduction of dose reference values shall be performed if the expected exposure situation changes significantly.

11. Medical supervision

Occupationally exposed persons in category A must only perform tasks relevant to radiation protection if they have been examined by an authorised doctor in accordance with § 77 StrlSchV within the last 12 months before performing the task and the SSV has a certificate issued by this doctor that states that the activity does not give rise to any health concerns.

The medical examination must be repeated every year.

Appointments for examinations must be arranged with the doctor authorised under radiation protection law by:

*Heidelberg University Hospital AöR
Occupational Medical Services
Im Neuenheimer Feld 130.3
D-69120 Heidelberg
Phone: +49 6221 56-8966.*

Occupationally exposed persons in category B are only subject to mandatory examination if the competent public authority has generally ordered this or has specified it for individual cases.

12. Working behaviour – generally applicable rules

The basic rules of radiation protection shall apply when handling radioactive substances:

- Maintaining distance
- Limiting the time spent in the immediate vicinity of the radiation source
- Use of suitable shielding

The protective equipment provided must be used when handling other radioactive substances and when operating X-ray equipment or stray radiation emitters (see activity-related instructions in local or specific Radiation Protection Instructions). They must be in perfect working order.

Every person working in radiation protection areas at Heidelberg University must organise and perform their work so avoid any danger to others.

Defects in radiation protection, control, or measuring equipment must be reported to the competent SSB without undue delay.

The competent SSB generally must be available on site or at short notice (usually within 30 minutes). Deviations and detailed specifications must be stipulated in the local or application-specific Radiation Protection Instructions.

Possible exposure must be assessed by the competent SSB when preparing and performing any new work projects. Work procedures and protective measures must be selected to minimise exposure as far as is reasonably achievable.

Special rules of conduct can be found in the local or application-specific Radiation Protection Instructions.

13. Maintenance, inspection, and leak testing

Testing of X-ray equipment and stray radiation emitters

X-ray equipment must be inspected by an expert or in compliance with the approval conditions in accordance with § 88 (4) StrlSchV at least every five years.

Stray radiation emitters requiring approval must be inspected by an expert in accordance with the authorisation requirements in accordance with § 88 (5) StrlSchV.

Testing of enclosed radioactive substances

Leakage tests on enclosed radioactive substances must be performed in conjunction with the approval conditions in accordance with § 89 (1) sentence 1 StrlSchV.

Any leaks of enclosed radioactive substances and defects in devices in which they are integrated that are detected must be reported to the competent public authority in accordance with the operational reporting chain without undue delay.

If any leaks are suspected (due to mechanical damage, corrosion, or following exposure to fire), an expert must verify that the encapsulation of the enclosed radioactive substance is leakproof before any further use occurs.

Special tests, deadline extensions, or exceptions can be found in the local or application-specific Radiation Protection Instructions or the approval.

14. Operational radiation protection checks

The SSB must monitor compliance with all provisions of these Radiation Protection Instructions. Frequency of the checks must be adjusted to the operation's needs and included in the local or application-specific Radiation Protection Instructions. Performance of such checks must be documented; any defects found must be documented separately and their removal must be arranged at once.

The inspection shall focus in particular on

- checking the function of the dose, dose rate, and contamination measuring devices,
- checking any work surfaces, corridors, door handles, etc. for contamination,
- compliance with the provisions on working behaviour by the persons otherwise employed,
- approval documents, expert test reports, and annexes to the Radiation Protection Instructions being up to date,
- keeping the operating log (see section 18), and
- effectiveness of the measures.

The persons responsible within the company are listed in Annex 2; changes in responsibilities must be documented (e.g., in the operating log, see section 18).

15. Procurement of other radioactive substances and radiation protection equipment, accounting

1. Procurement of other radioactive substances

- a. Procurement of other radioactive substances shall be performed by the SSBs of the departments and facilities or their deputies and must be signed by them in person. The order shall require written form. Orders by phone are not permitted. The SSBev must be informed of any planned procurements.
- b. The SSBs of the departments and facilities, or their deputies, must ensure in particular that the approved handling and storage activities are complied with in the context of procurement.
- c. Other radioactive substances must only be delivered to the SSBs of the departments and facilities or their deputies in person.

- d. Payment orders, invoices, and delivery notes shall be sent to the University's financial accounting department via the department 2.3 - Radiation Protection of CENTRAL SERVICES Neuenheimer Feld together with the accompanying invoice sheet; electronic invoice processing is permitted. Financial accounting shall authorise the payments once the approval of the SSBev or a deputy has been received.
2. Procurement of X-ray equipment and stray radiation emitters must be brought to the attention of the department 2.3 - Radiation Protection of CENTRAL SERVICES Neuenheimer Feld in a timely manner to secure the interests of operational radiation protection and, in particular, to plan any constructional measures that may be required.
3. Procurement of radiation measuring devices and other radiation protection equipment shall be in accordance with the procurement of other radioactive substances. The department 2.3 - Radiation Protection of CENTRAL SERVICES Neuenheimer Feld shall provide the facilities with technical support in the form of advice on product selection, also to ensure that the facilities are uniformly equipped.
4. Accounting of the acquisition, location, and handover of other radioactive substances is stipulated in § 85 StrISchV. The data to be collected are contained in the local or mission-specific instructions. The accounts shall be kept by the department 2.3 - Radiation Protection of CENTRAL SERVICES Neuenheimer Feld; the department must be informed in due form using the accompanying sheet to the radiation protection invoice (*Rechnungsbegleitblatt*). Invoices may also be processed electronically.¹¹

16. Behaviour in cases of incidents and exceptional operating conditions, access control

Incidents and exceptional operating conditions

An incident shall be an event in a planned exposure situation that has led, may have led, or could have led to unintentional exposure.

¹¹ Specialised e-invoice procedure of Heidelberg University (xSuite Cube)

Unintentional exposure occurs when the actual exposure exceeds the values expected for regular operation by more than the usual fluctuation range, even if no limit values are exceeded.

This may be the case, for example, if a technical fault or a malfunction in the operating process occurs.

If an incident occurs, everyone will be obligated to inform the competent SSB(s) in person or by phone without undue delay. The company reporting regulations shall apply in addition to this (see also “Annex 5 – Alarm Plan”).

The competent SSB shall be responsible for assessment of faults.

The SSB shall record the causes and effects, take measures to eliminate and limit the effects, and define provisions for the prevention of similar incidents.

The competent SSB shall check whether the criteria in Annex 15 StrlSchV for a significant incident are met and shall inform the SSBev if necessary.

Access control

The following measures must be taken to prevent unauthorised access by third parties to the affected radiation protection areas of Heidelberg University:

- The radiation protection areas of Heidelberg University must be kept closed at all times. In particular, locking in the evening must be ensured.
- Access to the radiation protection areas is generally restricted to members and affiliates of Heidelberg University, as far as this is necessary in the context of research, teaching, and training. Visiting scholars shall be considered equal to university members.
- Access by third parties (external and cleaning personnel) is only permitted upon coordination with the competent SSB; a local supervisor must be provided if necessary.

The competent SSB must be informed without undue delay if any unauthorised access to a radiation protection area is suspected; the SSBev shall be informed alternatively. The area must be secured until the SSB(s) arrive on site.

17. Behaviour upon detection of radioactive substances

A radiation protection officer must be called in immediately, the department 2.3 - Radiation Protection of CENTRAL SERVICES Neuenheimer Feld must be informed if (potentially) radioactive substances, X-ray equipment, or interference emitters are found. The department shall determine measures for securing and transporting the items.

All substances on which labelling or marking suggests the presence of any radioactive substance shall be considered potentially radioactive substances. This includes, in particular, chemicals that contain uranium and thorium or welding electrodes, containers, or small parts that are marked with *ECD*, *emitter*, *source*, but also any containers bearing radioactivity symbols.

Under no circumstances must such materials and devices be disposed of in the conventional household waste or as laboratory waste or sewage.

18. Operating log

An operating log must be kept for each radiation protection area in the areas covered by these instructions. Important processes and events for radiation protection must be entered in the operating log.

The operating log must be readily available in the radiation protection area; it must be kept properly by the users and SSB.

The following processes and events in particular must be entered in the operating log:

- Dates of completed instructions, tests (equipment tests, leakage tests, etc.), ...
- Daily inspection of the radiation protection area for contamination
- Change of responsibility (appointments/dismissals) and prolonged absence of the SSB
- Deviations from regular operation
- Maintenance work
- Acquisition/handover of sealed radioactive substances
- Acquisition/handover of open radioactive substances
- Commissioning/decommissioning of X-ray systems or interference emitters

The local or application-specific Radiation Protection Instructions stipulate further details on this.

Device logs may also be kept for X-ray devices or systems and stray radiation emitters.

The operating logs are the property of Heidelberg University. Completed operating logs must be kept in the offices of the competent SSBs; they must be handed over to a new SSB if the SSB changes.

Operating logs must be handed in to the department 2.3 - Radiation Protection of CENTRAL SERVICES Neuenheimer Feld to be archived there when a radiation protection area is closed down.

19. Service providers and external companies

The preceding sections on access regulations, briefings and instructions, and determination of the body dose generally must be observed when any tasks are performed by service providers or external companies in radiation protection areas.

If a person's work in radiation protection areas may lead to an effective dose of more than 1 mSv for a calendar year, it must be ensured that the company providing the service has the appropriate approval before work commences.

If the service provider requires a corresponding approval for its activities, the tasks and obligations of both companies must be contractually defined. Protective measures and system-specific instruction must be defined in each case. The work must be documented in the operating log.

Special provisions can be found in the local or application-specific Radiation Protection Instructions.

20. Announcement of the Radiation Protection Instructions

The SSV shall issue the *Radiation Protection Instruction for Heidelberg University* and publish them in the Heidelberg University Gazette. The Radiation Protection Instruction shall be binding upon all members and affiliates of Heidelberg University, as well as any persons who work in the radiation protection areas of Heidelberg University.

These *Radiation Protection Instructions for Heidelberg University* and any amendments to them shall be forwarded to the appointed SSBs and their deputies by the SSBev; the receipt of these Radiation Protection Instructions for Heidelberg University is to be acknowledged in writing.

The SSBs are obligated to inform the occupationally exposed persons about the content of the applicable *Radiation Protection Instructions for Heidelberg University* and the annexes. These persons confirm by their signature that they have received access to these *Radiation Protection Instructions for Heidelberg University*, have taken note of them, and have understood the content.

The Rectorate approved these *Radiation Protection Instructions* on 26 July 2023. They shall enter into effect immediately and replace the *Radiation Protection Instruction for Heidelberg University and the Heidelberg University Hospital* of 22 September 2002.

Heidelberg, 26 July 2023

signed, Prof. Dr. Dr. h.c. Bernhard Eitel
Rector

The annexes are available online.

The full text of the respective resolutions and by-laws is available at

Heidelberg University
University Administration
Law and Committees Division
Seminarstraße 2
D-69117 Heidelberg

during usual business hours.