Basic training course for radiation protection officers (RPO) class II & III for industrial or medical applications

SCK•CEN (Mol, Belgium)

Objective

With the transposition of the 2013/59/EURATOM Directive into national legislation, professional profiles in radiation protection are defined to advise on, and implement the measures necessary to protect workers, the public and the environment against the detrimental effects of an exposure to ionising radiation. One of these professional profiles is the **Radiation Protection Officer (RPO)**, defined to be an individual who is technically competent in radiation protection matters relevant for a given type of practice to supervise or perform the implementation of the radiation protection arrangements. This will be a designated in-house employee within the licensed undertaking.

The Federal Agency for Nuclear Contol (FANC) has designed a Technical Decree regarding the educational requirements of the RPOs, where a distinguishment is made between different classes of installations and the use of devices emitting ionising radiation vs the use of open radioactive sources. These educational requirements include a basic training course, an additional training course and a practical training course. The complete educational programme has to be approved by the radiation protection expert associated with the undertaking.

This training course focuses on the theoretical basic training course, and consists of 2 modules:

- Basic principles of ionising radiation and radiation protection (1 day)
- Specific topics related to devices emitting ionising radiation, or the use of radioactive sources (half day per domain)

During this training course, a general approach is used which is applicable in various sectors. Depending on the training session, the focus will be put on industrial applications or medical applications.

This theoretical training course needs to be completed by an additional training course and a practical training course, under the responsibility of the license holder of the undertaking and approved by the radiation protection expert associated with the undertaking.

Target audience

This training course is aimed at professionals who work with devices emitting ionising radiation and/or radioactive sources and who will be likely be appointed as radiation protection officers (RPO) within a licensed undertaking of class II or III.

During this training course, the focus lies on the practical implementation of radiation protection on the workfloor, and approaches are provided which apply in various domains. Depending on the training session, the focus will be put on industrial applications or medical applications.

Required knowledge

No specific pre-knowledge is required, but a basic notion in scientific concepts in chemistry, physics and biology is assumed.

Topics

This training course contains the following topics:

- Introduction to ionizing radiation and interaction with matter
- Health risks caused by exposure to ionizing radiation
- Introduction to detection and dosimetry
- Individual and collective means of protection
- Radiological risk analysis
- Legal obligations in radiation protection

The following topics are treated in the specific training module for the use of devices emitting ionising radiation

- X-ray technology: function and good practice
- Organisation of the tasks of the radiation protection officer

The following topics are treated in the specific training module for the use of radioactive sources

- Introduction to radioactivity
- Good practice when working with radioactive sources
- Transport of radioactive materials
- Organisation of the tasks of the radiation protection officer

An assessment is programmed at the end of each module.

Language

This course is organised in Dutch, and can be organised in French or English on demand.

Customised

This training course can be tailored to the needs of your company. Programme, duration, level, language (Dutch, French or English), venue, etc. are defined in agreement with the customer. The course can consist of theoretical classes and practical exercises, complemented with a technical visit to one or more of SCK•CEN's installations. When requested, the courses can also be given at the premises of the customer.

Duration

This 2-day training course is provided from 09h00 to 17h00, including a short coffee break per half day, as well as lunch. Separate training tracks are possible for when working with radioactive sources (1.5 day) or devices emitting ionising radiation (1.5 day). A combination of both tracks is possible by following the whole 2-day training course.

Registration

Registration is only available online on http://academy.sckcen.be/en/Upcoming-events.

Contact and venue

The course is held at the Lakehouse of the Belgian Nuclear Research Centre, Boeretang 201, BE-2400 Mol, Belgium.

Rooms can be booked at the Lakehouse hotel or at the the Alauda Hotel in Dessel.

Further information is available via academy@sckcen.be or + 32 14 33 21 57.

http://academy.sckcen.be

Basisopleiding stralingsbescherming RPO klasse II & III

Deel 1: Stralingsbescherming basis

09:00 – 10:00 u	Inleiding ioniserende straling en interactie straling en materie

- Inleiding verschillende types ioniserende straling
- Opbouw materie
- Interactiemechanismen van alfa, beta en fotonen met materie

10:00 – 10:45 u	Biologische effecten van ioniserende straling

- Deterministische en stochastische effecten van ioniserende straling
- Stralingsgevoeligheid
- LNT theorie

10:45 – 11:00 u	*Pauze*

11:00 – 12:00 u	Detectie en dosimetrie

- Inleiding dosimetrische begrippen
- Principe meten van ioniserende straling
- Voornaamste groepen detectoren en toepassingen
- Passieve vs actieve vs biologische dosimetrie

12:00 – 13:00 u	*Lunch*

13:00 – 13:30 u	Individuele en collectieve beschermingsmiddelen

- Bestraling vs besmetting
- Bescherming tegen externe bestraling
- Bescherming tegen inwendige en uitwendige besmetting

13:30 – 14:15 u	Risicoanalyse met betrekking tot radiologische risico's

- Verschillende methoden van risicoanalyse (What if, FMEA, Fault/Event Tree Analysis, Job Safety Analysis)
- Case studies inzake risicoanalyse in de stralingsbescherming

14:15 – 14:30 u	*Pauze*

14:30 – 16:30 u	Regelgeving stralingsbescherming

- Algemene principes stralingsbescherming
- Organisatie fysische controle en van de reglementaire opdrachten van de RPO
- Vorming werknemers
- Veiligheidsfactoren (Tijd-afstand-afscherming, voorkomen van contaminaties)
- Notie externe werkers (Equivalente bescherming, vorming, PBM)
- Melding en maatregelen in geval van incident
- Vergunningenstelsel

16:30 – 17:00 u	*Kennistest*

Basisopleiding stralingsbescherming RPO klasse II & III

Deel 2: Stralingsbescherming bronnen en toestellen

Stralingsbescherming voor radioactieve bronnen

09:00 – 09:45 u	Inleiding radioactiviteit

- Radioactiviteit: eigenschappen en voorbeelden
- Berekeningen van activiteit

09:45 – 10:45 u	Goede praktijk bij werken met radioactieve bronnen

- Preventie, monitoring en beheer van besmettingen
- Gebruik van PBMs
- Signalisatie en afbakening
- Beheer van radioactieve bronnen
- Werkprocedures bij het gebruik van radioactieve bronnen
- Controle van HAIB
- Beheer van radioactief afval

10:45 – 11:00 u	*Pauze*
11:00 – 12:00 u	Transport van radioactieve materialen

- Wetgeving transport
- Toezicht op verpakken, laden en lossen van radioactieve bronnen
- Werkprocedures relatief aan de voorbereiding en de ontvangst van transporten ADR klasse 7

12:00 – 12:30 u	*Kennistest*
12:30 – 13:30 u	*Lunch (enkel voor wie twee dagdelen volgt)*

Stralingsbescherming voor toestellen die ioniserende straling uitzenden

13:30 – 14:45 u	Röntgentechnologie: werking en goede praktijk voor de beperking van de dosis

- Technische parameters (kV, mAs, filtering, collimatie, pulsering)
- Oriëntatie en positionering
- Afscherming
- Werkprocedures voor röntgentechnologie
- Veiligheidssystemen

Tom Clarijs

14:45 – 15:00 u	*Pauze*

15:00 – 16:30 u	Organisatie van controle in kader van de reglementaire opdrachten van de RPO

- Taken RPO in verband met toestellen die ioniserende straling uitzenden
- Extra taken RPO in verband met radioactieve bronnen
- Signalisatie en afbakening
- Controle van de beschermingsmiddelen
- Controle veiligheidssystemen
- Maatregelen in geval van incident
- Rapportering en communicatie

Tom Clarijs

16:30 – 17:00 u	*Kennistest*