

JUSTIFICATION

REGULATION

RD 20/07/2001

- ✓ 3 basic principals of radiation protection (art. 20.1.1.1)
 - JUSTIFICATIE
 - ALARA (=As Low As Reasonably Achievable)
 - DOSE LIMITS
- ✓ LICENCES (art. 5)
- ✓ HEALTH PHYSICS (art. 23):
 - CLASS III: 1x/year
 - CLASS II: 4x/year
- ✓ INSPECTIONS (FANC law '94): FANC

PRINCIPALS OF JUSTIFICATION

NEW APPLICATION

- ➔ Before first use: Study for justification
- ➔ Licence = Justification certificate

EXISTING APPLICATION

- ➔ Review possible by Agency when new and important knowledge regarding its effectiveness and its effects are known
- ➔ Ban via Royal Decree after proposition of Agency and advice of Superior Health Council and/or High Council for Prevention and Protection at Work

CASES

- CASE 1: Refusal of an unauthorized practise
 - ➔ On stream non destructive testing of pipelines with handheld X-ray device
- CASE 2: Partial refusal of an unauthorized practise
 - ➔ Portable Dental X-ray
- CASE 3: Refusal of an already authorized practise after re-evaluation
 - ➔ ^{241}Am for filling height measurement
- CASE 4: On-going examination of (partial) refusal
 - ➔ Mechanical doping checks with X-ray device

Origin

- Case 1: Use of handheld X-ray device for on stream inspection
 - Given the age of certain installations, the petrochemical sector searched techniques to perform on stream inspections;
 - Handheld X-ray devices (e.g. Sentinel Openvision) are available on the market and in use in several countries (USA, France,...)
 - Application by Belgian NDT company in march 2016
- Case 2:
 - New medical device for “easier” intraoral X-rays is available on the market;
- Case 3: Use of ^{241}Am for filling height
 - Request for extension with a new ^{241}Am source in November 2014;
 - Other operators switched (partially) to the use of X-ray devices
- Case 4
 - First case of mechanical doping detected by UCI in January 2016
 - UCI uses a tablet with customised app for detection
 - Checks by X-rays are investigated



Simultaneous treatment and regroupment in 1 RD

Road to publication

- Sectorial
 - Communication stakeholders (inspections, letter of intent,...)
 - Consultation with federations
- Advisory organs
 - Scientific council
 - Advice of High Council for Protection at Work on 11th January 2017;
 - Advice of Superior Health Council on 19th May 2017
- Cabinet
 - Advice of Inspection of Finance on 6th September 2017
 - Approval of the Minister of the Budget of 19th September 2017
 - Advice of Policy Coordination Working Groups (formerly 'Inter-cabinet Working Groups')
 - Advice 62.412/3 by the Council of State on 29th December 2017
- Adaptation text following the advice of the Council State
- Signature 4th May 2018
- Publication of prohibitions on 24th May 2018 in the Belgian Official Gazette

CASE 1

- SECTOR: INDUSTRIAL RADIOGRAPHY
- APPLICATION: ON STREAM WITH HANDHELD X-RAY DEVICE (e.g.: Openvision)



CASE 1

- REASONS:
 - Study revealed a high dose for operators
 - Non of the three principles for radiation protection (time, distance and shielding) can be implemented in use
 - Alternatives are available (removing insulation, ultrasonic checks, traditional industrial radiography using films or phosphor plate)

CASE 2

- SECTOR: DENTAL RADIOGRAPHY
- APPLICATION: PORTABLE DENTAL X-RAY

Portable Dental X-ray



Only justified in certain cases

Fixed Dental X-ray



CASE 2

- REASONS:
 - Impaired radiation protection for user
 - Good image quality can not be guaranteed due to an increased risk of motion artifacts
- HOWEVER
 - Justified for persons with special needs (e.g.: elderly and/or disabled people in care institutions, who find it hard to go to a hospital or a private dental practice)

CASE 3

- SECTOR: BREWERIES
- APPLICATION: FILLING HEIGHT WITH ^{241}Am

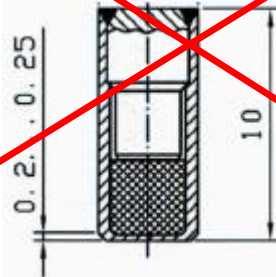
Americium-241

Use/Application:

- Industrial thickness gauging

Radiation:

- Gamma radiation, $E = 59\text{keV}$



CASE 3

REASON 1: ADVANTAGES OF RX



- No risk for contamination in the case of fire...
- No radioactive waste
- Possibility to completely stop the radiation
- Easier maintenance and replacement (disassemble, replace, store)
- No transport requirements
- No risk for orphan sources (after bankruptcy)
- No security risk (terrorist material)



- Doserate in primary bundle can be higher
 - Use of protective cages

CASE 3

REASON 2: FINANCIAL (OPERATIONAL)



Class II Sources

- Annual fee: € 2017/year
- Modification licence: € 705
- New Licence: € 1411
- 4 controls/year

Class III X-RAY

- Annual fee : € 118/year
- Modification licence : € 0
- New Licence: € 352
- 1 control/year



- More expensive in purchase?
- Investment for conversion of production line

CASE 3

REASON 3: FINANCIAL (WASTE)



- (Very) high processing cost radioactive waste
 - Processing costs are fast rising and unpredictable
- No contribution for NIRAS
- No contribution for insolvency fund (NIRAS)
- FANC Licence in class III regime (sources = klasse II)



- None

CASE 3

FANC POLICY

^{241}Am



- Before publication of refusal
 - Intention of refusal for new/extension of licence
- After publication of refusal
 - No new ^{241}Am for filling height will be licenced
 - Phasing out of existing sources before 2020

CASE 4

SECTOR: CYCLING (UCI)

APPLICATION: MECHANICAL DOPING CHECK



CASE 4

- Initially the UFC stated that mechanical doping could be found with a tablet equipped with a magnet that detects magnetism of motor
 - ➡ Process for refusal started
- The Agency was afterwards contacted again by UCI because follow-up tests showed inaccuracies
 - ➡ Process halted
 - ➡ Licence to perform checks using X-ray device under conditions was issued
 - ➡ On-going investigation

Other example

Thickness measurement in textile sector



X-Ray



^{241}Am source



^{90}Sr source



^{85}Kr source

- Intention for refusal new/modification licences for sources
- Currently no legal refusal in preparation

PHASE OUT SCENARIO - DISCUSSION



- In consultation with sector
- Renewal/extension of existing permits?
- Legal refusal with transitional period?
- Feasible transition period?
- Financial and technical feasibility?

