

# Legislative framework for accidental exposures

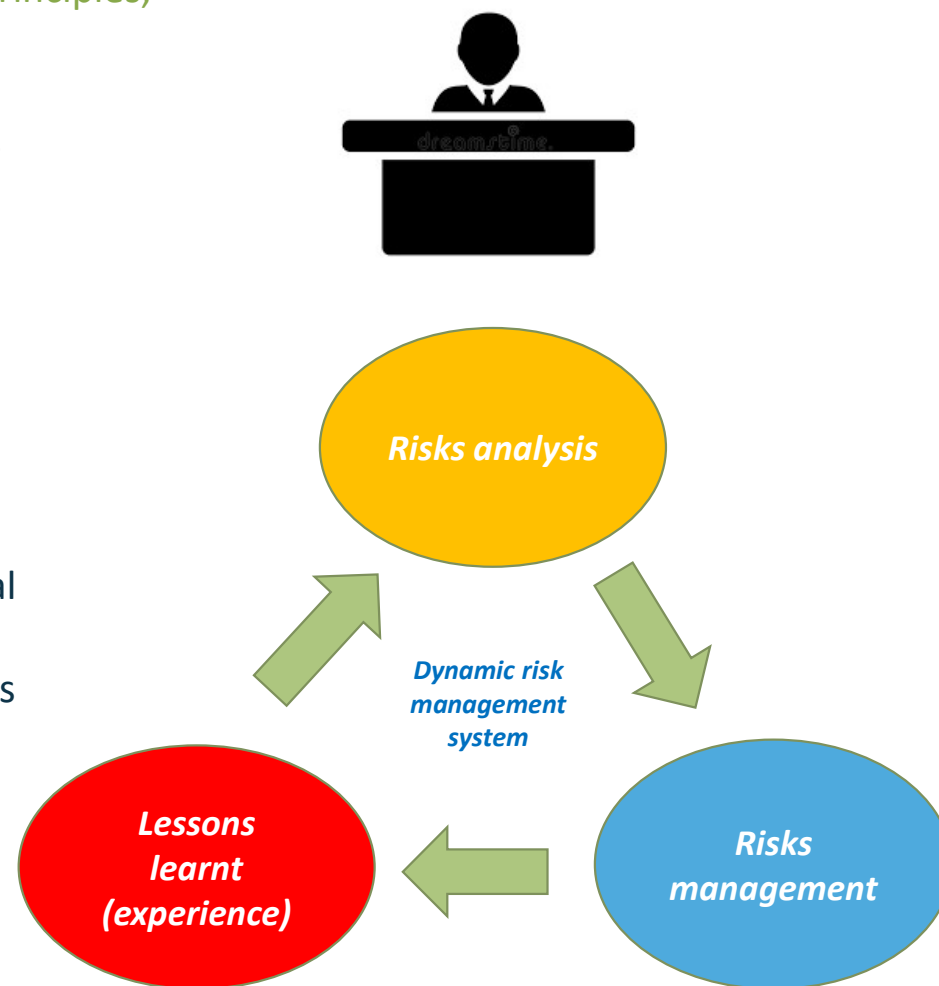
Sophie Léonard - FANC

# The starting point: good prevention and protection

## The employer

(Code on well-being at work, Book I - General Principles,  
Title 2 - General Principles of wellbeing Policy)

- Implements a **dynamic risk management system** consisting of a continuous iterative process aiming to:
  - (Re)analyse the risks
  - Manage the risks:
    1. Avoid the risks
    2. Fight against risks at the source
    3. Plan, implement, supervise, re-evaluate the means of prevention and protection (collective protection measures and work procedures/organization, personal protection equipments, danger signs, ...)
    4. Anticipate dangerous situations, accidents or incidents -> if required-> Internal Emergency Plan - IEP
  - Consideration of incident/accident experience
- **Informs/involves all the links in the chain about the risks and means of prevention/protection and emergency measures**



# The starting point: good prevention and protection

## The radiation protection expert

(art 23 of the RGPRI-ARBIS)

- Review, input/comments and approval on :
  - the radiation protection (RP) oriented risk analysis
  - means of prevention and protection against radiation
  - means of dosimetric monitoring
  - RP work procedures
  - procedures describing the measures to be taken in case of an incident/accident
  - the content of information and training of workers.
- Preparation for emergency exposure situations and emergency response
- Determination of individual doses and radioactive contamination of persons

*Job visits*



*Collaboration with the approved occupational physician!*



## The starting point: good prevention and protection

### The radiation protection officer

(art 25.1.5 a) of the ARBIS-RGPRI)

- Control of compliance with measures, rules and work procedures related to radiation protection
- Control of the correct identification and management of radioactive contamination
- Control of protective means and devices, measuring instruments and dosimeters (available, in good working order, correctly used)
- Characterization of ionizing radiation (intensity, nature)
- Periodic assessments of the status of relevant safety and warning systems at the RP level
- Information to persons on IR risks + guidelines to follow in case of incident or accident;

*According to the  
instructions and  
procedures approved  
by the certified expert*



## The starting point: good prevention and protection

### The approved occupational physician

(art 24.2 of ARBI/RGPRI & art II.1-4 to II.1-6 of the Code on well-being at work)

- Review, remarks/contributions from a health point of view (including ergonomics and hygiene) about:
  - RP-oriented risk analysis
  - Means of protection
  - Dosimetric monitoring means
  - Initial and continuous training programs for workers
  - Procedures describing the measures to be taken in case of an incident/accident
- Regular monitoring of individual worker dosimetry results and interpretation of doses from a health perspective
- Participation to the organisation of the first aid

*Job visits*



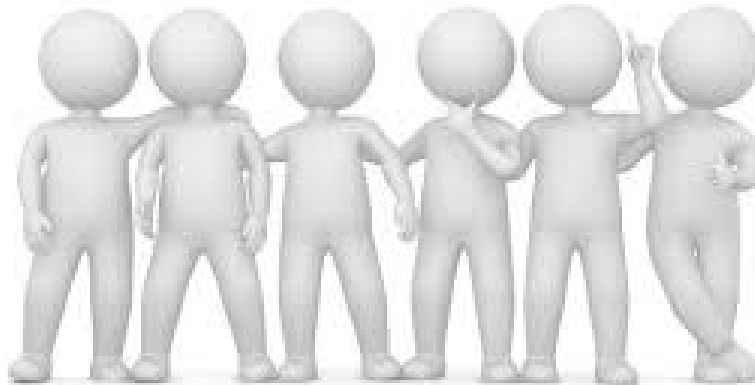
*Collaboration with  
the radiation  
protection expert*



## The starting point: good prevention and protection

### **The workers** (art 26 of the ARBIS/RGPRI)

- Comply with measures, rules and work procedures related to radiation protection
- Assist in their own radiation protection to the extent possible



# How to manage an accidental exposure?

## **The workers** (art 26 of the ARBIS/RGPRI and 1.2-26 the Code on well-being at work)

- Immediate notification to:
  - the health physics department (or internal prevention and protection service)
  - the appropriate member of the line of authority



## **The radiation protection officer** (art 23.1.5, a) of the ARBIS/RGPRI)

- Adopt the 1<sup>st</sup> urgent measures that are necessary (e.g. a markup in the event of an unexpected release of radioactive substances)
- Transmit the information immediately to
  - to the head of the health physics department (or internal prevention and protection service)
  - to the radiation protection expert



## How to manage an accidental exposure?

### The head of the health physics department

(art 23.1.7 and art 67.2 of the ARBIS/RGPRI)

- Immediately takes all useful measures to mitigate the detected danger, if necessary in consultation with the radiation protection expert
- Immediately involves the approved occupational physician, at least if:
  - an occupationally exposed or non-occupationally exposed person has been subjected to an accidental exposure exceeding the dose limits
  - whenever an accident involving a serious exposure hazard occurs.

*Good practice: always involve the approved occupational physician in case of accidental exposure of a worker*





# How to manage an accidental exposure?

## The radiation protection expert (art 67.2 and 23.1.5 b of the ARBIS/RGPRI)

- In-depth study of the circumstances
- Determination of the external/internal doses incurred, using in particular for this purpose the appropriate individual dosimetry methods:
  - emergency dosimeter reading
  - biological dosimetry
  - in vivo/in vitro radiotoxicological analyses
  - dose reconstruction based on the exposure scenario, ambient dosimetry, dosimetry of the other exposed workers, ...
- Recommendation of immediate and preventive measures

In close consultation with the approved occupational physician!!!



# How to manage an accidental exposure?

## The approved occupational physician

(art 24.2 and art 20 of the ARBIS/RGPRI and art.V.5-17 of the Code on well-being at work)

- Assess and interpret accidental internal/external doses from a health perspective
- Advice on the medical treatment that may be required
- Exceptional medical surveillance examination: legally, if dose limits are exceeded but the **good practice** is to do it automatically (*as a precaution and taking into account the psychological dimension of the worker*)
- If necessary, extended medical surveillance
- If dose limits are exceeded, advice on whether the worker should remain at the workstation (with accommodations) or be removed from it
- Record the accidental exposure (doses, circumstances and actions taken) in the health file.
- Advice on immediate and preventive measures



Close consultation with  
the radiation protection  
expert!!!

# How to manage an accidental exposure?

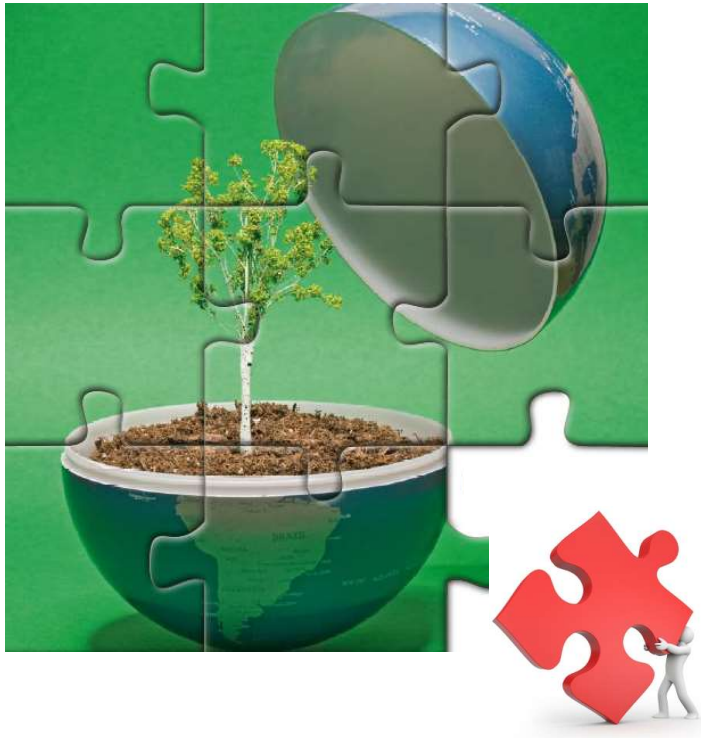
## The operator/company manager (article 67.2 of the ARBIS/RGPRI)

- Notifies the FANC as soon as possible if:
  - Exposure that may result in deterministic effects or finding of deterministic effects.
  - Accidental contamination of person(s) (internal and/or external) that requires 'first aid' intervention or specific treatment/follow-up in the context of health surveillance.
  - Exceeding a legal dose limit or a dose constraint imposed by the Agency.
  - Poorly controlled or uncontrolled situation that may lead to an exceedance of a legal dose limit.
  
- According to the FANC criteria and modalities : types of events to be declared, deadlines for declaration, information channels, information to be provided, ...
  - TR of 17/06/2020 establishing the criteria for reporting to the FANC significant events related to the RP and/or safety of workers, the public and the environment during practices in class II and III establishments and during transport
  - TR of 05/07/2019 establishing the procedures and criteria for reporting significant events related to nuclear safety, the protection of persons and the environment in Class I facilities



# How to manage an accidental exposure?

## The FANC



- Assistance, advice
- Recommendations for further actions
- Possible inspections
- Central point of contact and information gathering
- Specific information
- Experience
- Experience feedback (REX) to the sector and the public



# How to manage an accidental exposure?

## Useful references in case of acute accidental irradiation

### ■ Dose assessment

- There is a latency period before biological effects appear
- **HOWEVER**, it is essential to take the right therapeutic actions quickly!



➔ Need for a rapid and reliable estimate of the dose received to anticipate biological effects



Emergency dosimeter reading + if relevant, biological dosimetry (to be compared retrospectively with the dose read)



**Ugent, Vakgroep structuur en herstel van de mens, Onderzoeksgroep Radiobiologie, Biologische dosimetrie**, UZ Campus, ingang 46, gebouw B3, 6<sup>de</sup> verdieping, Corneel Heymanslaan 10, 9000 Gent, Prof. Dr. A. Vral, Tel: 09/ 332 51 29, [biodosimetry@ugent.be](mailto:biodosimetry@ugent.be)

### ■ Short-term treatment

- After acute local irradiation ( $D > 15 - 20$  Gy!) and high whole body dose ( $D > 2 - 3$  Gy) -> University hospitals, but preferably:

**Hôpital d'Instruction des Armées Percy, Avenue Henri Barbusse, 101, 92140 Clamart, France, Tel: +33 1 41 46 60 00**

- **More info:** → Presentation "**Treatment and follow-up of incidentally exposed workers (L. Holmstock, SCK)**" given at the [2013 FANC training for occupational physicians](#) on "**How to react in case of incidents/accidents**"

# How to manage an accidental exposure?

## Useful references in case of personal contamination

- Practical information on decontamination techniques and determination of the internal or skin dose → presentations given at the [2014 FAN C training for occupational physicians](#) on “**How to handle contaminations & internal dosimetry put into practice**”
- Contact information of laboratories performing radiotoxicological analysis with (application for) recognition:
  - **SCK, Laboratorium voor Lage Radioactiviteitsmetingen**  
[https://www.sckcen.be/nl/Services\\_Consulting/Analyses\\_Measurements/Low\\_level\\_measurements\\_michel.bruggeman@sckcen.be](https://www.sckcen.be/nl/Services_Consulting/Analyses_Measurements/Low_level_measurements_michel.bruggeman@sckcen.be)
  - **IRE, Laboratory of Radioactivity Measurement** (Dieudonné Tony, [bus@ire-ELIT.eu](mailto:bus@ire-ELIT.eu), Tél: 071 82 95 56)
  - ... (The legal transition period is ongoing, other labs may also apply for recognition in the near future).
  - ...



Questions ?

Bedankt!  
Merci!