EUROPEAN ALARA NETWORK

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Unlike NASA's *Curiosity*, you cannot take a selfie on Mars …
However, you can travel with the EAN Newsletter

Curiosity selfie's at Mont Mercou, 30 March 2021
Image Credit: NASA/JPL/CalTech/MSSS

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EDITORIAL

ABOUT ENDURANCE AND RESILIENCE

In 2021, the EAN celebrates its 25th anniversary.
During the last quarter of a century, the network has slowly grown up, became independent (financially) and made friends and relationships. In the last months, several Organizations that are already Members have reiterated their support to the EAN by nominating a new representative and, in parallel, two new Organizations have joined. [1] Today 22 organizations in 18 countries are engaged in the EAN Steering Group. None of this would have been possible without the ongoing enthusiasm and endurance of all the Members!
The growing phase is certainly not finished; please contact the Editorial Board if you want to step in!

The Network has not forgotten its core foundation: the optimisation principle. As such, the first article (**p. 3**) is presenting the results of an EAN and ERPAN brainstorming meeting and European survey on the application of the "graded approach" for radiation protection regulation in the workplace.

These days, the word "*contamination*" is more frequently associated with "*Covid-19*". **However, let's do not forget that contamination with radioactive material still has the potential to occur**, as epitomized by a recent incident in a medical installation reported to the OTHEA/RELIR database (**p. 10**).
In addition, the Swiss Federal Office of Public Health would like to present the RADISS plan for the continuous and adequate control of radioactive sources (**p. 13**).

2021 is also the **10th anniversary of the nuclear accident at Fukushima**. We present a (not exhaustive) list of webinars organized and reports published on this occasion (**p. 15**). Most of them focused on the health consequences in the affected population, the notion of well-being and resilience, and these topics find some echoes in these times of pandemic.

Reaching the age of (relative) maturity, the Network has begun to pile up its achievements. Notably Mr. Fernand Vermeersch, Chair, will present 'EAN 25 years of European Collaboration' at the congress of the French Society of Radiation Protection in June 2021.

Looking to the future, the EAN has just published its Strategic Agenda making a large feature of relationships.

We wish you a pleasant reading.

The EAN Newsletter Editorial Board.
Sylvain Andresz, Julie Morgan, Fernand Vermeersch and Pascal Croüail

Do not hesitate to send comments to the Board (cf. contacts **p. 19**).

[1] [1] New representatives come from Austria (AGES), Germany (BfS), Iceland (GR), Slovenia (SRPA) and new Members organizations come from The Netherland (NRG) and Switzerland (CERN).

The Graded Approach for Workplaces in the Context of the Implementation of Directive Euratom 2013/59

Synthesis of an EAN and ERPAN Brainstorming meeting and survey

Contributors:
Mr. S. Andresz, CEPN, France [Author]
Mr. S Coenen, FANC, Belgium
Mr. P. Croüail, CEPN, France
Mrs. C. Enkvist, SSM, Sweden
Mrs. J. Morgan, PHE, United Kingdom
Mrs. T. Kenny, EPA, Ireland
Mrs. C. Nuccetelli, ISS, Italy
Mr. T. Schneider, CEPN, France
Mr. N. Stritt, SFOPH, Switzerland, ERPAN Chair
Mr. F. Vermeersch, SCK•CEN, Belgium, EAN Chair

The Contributors thank the **Responders** of the 2019-2020 survey for sharing their experience.

N.B. This article is a summary of a brainstorming meeting that took place in December 2018 at CEPN and followed by a survey in 2019-2020.
These elements were presented at IRPA-15 Congress.

Context and objectives

The concept of a "graded approach" is commonly found in regulations and standards, e.g. in IAEA Safety Guides [2], ICRP Publications [3] etc. The definition of a graded approach may vary across organizations but the broad principle is that the requirements to manage an activity or practice are commensurate with the level of risk and potential hazards of the activity/practice.

In the European context, the Euratom Directive 2013/59 (EU-BSS) states that:

> *Article 24.*
> *"Member States should benefit from the application of a **graded approach to regulatory control**, which should be commensurate with the magnitude and likelihood of exposures resulting from the practices, and commensurate with the impact that regulatory control may have in reducing such exposures or improving the safety of installations."*

In this case, exemption, notification and authorization – which include registration and licensing – are the regulatory options under the graded approach (cf. art. 26 to 29).

The Euratom Directive is now implemented in national regulations (normally since 2018).
The EAN and ERPAN Members held a meeting in December 13th 2018 to brainstorm on their understanding of a graded approach and experience in implementing it. To narrow the discussion, it was decided to give a focus on the application of the graded approach for the protection of workers in workplaces. As starting points, four keynotes were presented that covered different activities and the resulting discussions took place between the presentations.

The brainstorming raised much interests from the participants during and also after the meeting. It was therefore decided to make a survey to collect more feedback and opinion on the graded approach. The last answer was received in mid-2020.

This article aims to summarize the discussion during the brainstorming, the results of the survey and then highlights the main findings and the key elements of a graded approach.

[2] *Use of a Graded Approach in the Application of the Safety Requirements for Research Reactors*, IAEA Specific Safety Guide No. 22G-22, International Atomic Energy Agency, Vienna, 2012.

[3] For example, in *Radiological Protection against Radon Exposure*, ICRP Publication 126. Ann. ICRP 43(3) and *Radiological Protection from Cosmic Radiation in Aviation*, ICRP Publication 132. Ann. ICRP 45(1), 1–48.

Examples of application in Belgium

With the implementation of the EU-BSS a list of **NORM industries** adapted to the Belgian context has been issued by the Authority FANC (86 industries on the list). Their respective operators are required to perform a dose assessment of their workers. The facility will then be submitted to a notification procedure (if dose exposure to the workers < 1 mSv/y) or to a licencing (if still > 1 mSv/y after protection measures applied).

When it comes to **NORM waste**, the regulatory scheme for their management, that is to say the type of treatment and type of landfill, is graded with the use of two numerical criteria:

- an activity concentration criterion (0.5 Bq/g) (derived from a dose criterion);
- and if the 1st criterion is exceeded, a second level of requirements may apply after using a dose based dose criterion (0.3 mSv/y).

Other considerations such as the presence of hazardous components in the waste and specific acceptance criteria decided by the operator of the landfill are used in the decision.

For **legacy sites**, the graded approach uses a dose criterion expressed in dose bands (the bands are 0-0.3, 0.3-1, 1-3 and > 3 mSv/y). This is used to decide if the intervention is more or less justified and under which protective measures. It has been highlighted that social and ethical factors are also considered in the decision; notably the final use of the site is a key point (ex. industrial site vs. kindergarten).

The topic of **transport** was also presented. Given that more than 400,000 packages/year are crossing Belgium, FANC reported the need to efficiently exercise its regulatory control of the transport companies under its oversight. This is done with the help of a specific decision-process, which considers 11 criteria associated to a transport company and calculates a score that will determine the number of inspections per year. Most of these criteria are not directly linked with radiation protection. The decision tool was presented to peers and different forum and identified as a 'Good Practice' by IAEA IRRS team.

Evolution of the system in Ireland

Ireland's current regulatory context requires that all users of ionizing radiation are liable to licencing and including **"all" medical practices**. For the transposition of the EU-BSS, the Environmental Protection Agency (EPA) has developed a model for graded authorisation based on a risk analysis at the level of the practice. The risk analysis is based on a large array of factors including:

- Documentary analysis (IAEA guidance, EU documentation, etc.),
- Several radiation protection factors such as the exposed individuals, the magnitude and likelihood of the exposure etc.)
- And also considering historical data reported by the practices and EPA regulatory experience, etc.

All these factors are fed into a peer-reviewed model (scoring matrix) and the output determines whether a medical practice is liable to registration or licencing (there is provision for exemption). The process is dynamic such that EPA can easily manage the list of practices liable to licencing (based on change in technology etc.)

An on-line service system (Graded Authorisation Management Information System - GAMIS) has been set up for licencing and registration and this system has a good feedback from EPA and the applicant/licensees. A more rigorous assessment and stronger inspector oversight are required for licence applications, whereas the registration process is based on a set of self-declared questions. EPA assumes compliance, that is, the responsibility is with the person registered to comply with all aspects of the legislation, but a registered facility can still be inspected if necessary.

The implementation of the graded approach is referred as a 'big shift' for both the regulator and the licensees/registered. The EPA judges that the graded approach allows for a better deployment of its resources and to focus its regulatory effort on the practices with higher risk. The new system of graded authorisation will result in a move from 1740 licensees to approximately 400 with a more appropriate system of regulatory oversight being utilised for registered

practices including, verification of the self-declaration through sampling, self-assessment questionnaires and inspections where relevant. The use of technology and IT systems is being leveraged for this purpose.
EPA plans to elaborate several Codes of Practices (4 are planned, covering all the medical sectors) to set out its view about the new regulatory framework and help the applicants to comply with the regulatory requirements. The Codes of Practices are developed with the help of medical professionals, through working groups and consultation process. Indeed, the professionals have the best insight on field-experience and what can actually work, and how to communicate it.

Graded approach in Switzerland

Switzerland also faces a peculiar regulatory context, especially in the medical field because all activities using ionizing radiation in humans will finally hold a licence. Companies that are supplying equipment, doing some maintenance and performing QA on medical system using ionizing radiation are also subject according to the Swiss legislation to licence. In addition, Switzerland has not signed the Euratom Treaty, but aims to align with the EU-BSS (the revised legislation put into force in 01.01.2018 was made according to the EU-BSS).

For **medical imaging practices**, the grading is based on the dose to the patient, which can be low (< 1 mSv), moderate (1-5 mSv) or high (> 5 mSv). The grading applies then to many aspects: the documentation, the type of supervision, the requisite level of education of the staff, the technical radiation protection requirements, the dosimetry etc. The requirements have been designed in collaboration with the professionals, and considering also the views of groups of experts (e.g. Dosimetry Expert Group), external groups and via public consultation. This does take time but is regarded essential for ensuring the graded approach is applicable in practice (and will be applied by the professionals).
Globally, the concept of the graded approach shaped the work and inspections and audits planned by the regulatory bodies and inspectors since many years.

The French graded approach for the management of radon exposure at workplaces

The management of **radon in workplaces** in France has evolved with the publication in 2018 of a series of decrees. The regulation is now binding to the employer/manager of all workplaces located in the basement/ground floor of radon prone areas. The entry point is a documentary analysis and, if the situation cannot be disregarded from a radiation protection point, radon measurement shall be performed. The graded approach is implemented by using two "reference levels" (one in Bq/m3 based in measurement, one in mSv/y based on (pessimistic) scenario). Ultimately an enhanced protection system applies to some workers (but they will not be regarded as 'workers working under ionizing radiation').

The entering into force of this regulation is very recent and has no feedback. A potential issue is the number of workplaces entering into the scope of regulation due to the size of the radon prone area in France. Most of these workplaces are from 'outside the world of radiation protection' so outreach and communication are at stake. Another peculiarity is that there are few providers of radon dosimeters and also few building professionals with experience in radon remediation.
The use of numbers (often seen as 'magic numbers' or threshold between safe and danger) and the comparison of radon exposure with other radiological exposures (e.g. normal exposures in a nuclear installation are generally far below) have also been raised in the presentation.

A survey

The brainstorming raised many interests from the participants during and also after the meeting. It was therefore decided to make a survey to collect more feedbacks and opinions on the graded approach, from Regulatory Authorities but also of licensees. A specific questionnaire was designed and disseminated by the Contributors (cf. annexe of this article).

A total of 12 questionnaires were collected in 2019 and 2020. Figure 1 presents the 10 countries and 20 situations of exposure / practices in total been covered by the survey and the brainstorming.

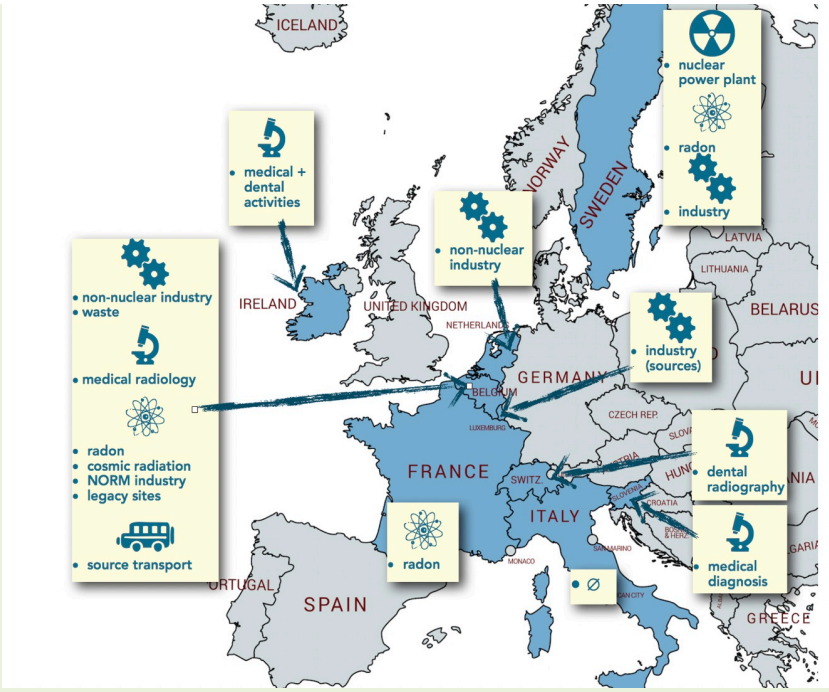


Figure 1. – Coverage of the EAN and ERPAN survey

A synthesis

A large panel of workplaces and situations has been presented and discussed, including exposure from man-made sources and to natural sources. From the keynotes, the discussions and the analysis of the answers to the survey, the following points can be drafted.

Why using a graded approach?

- When applied to regulatory supervision, the graded approach is reported to allow regulators to efficiently exercise their controls based on the radiation risks of the practice under their oversight. The regulator is aiming to direct its effort to specific areas and, without compromising safety, with proportionate attention to the other ones.
- From a licencee's point of view, the graded approach can result in diminution of the administrative burden and cost, even possible exemption to RP regulation.
- For workplaces, two dimensions can be considered as the first entry point: occupational exposure in routine (ex. mSv/y) and exposure in case of accident (potential mSv) – later, further and deeper analysis will be needed in the gradation.
- The graded approach is particularly relevant for
  - Large panoply of installations (ex. medical practices, Ireland);
  - And/or situations with a wide distribution of exposures/of risks (ex. NORM);
  - And/or situations with an elevated number of installations/cases (ex. 400 000 radioactive packages/year, Belgium; radon at work, France, Sweden).
- The graded approach is also relevant for practices involving natural sources, where the exposure are generally (but not always) very low and with no likelihood of over-exposure.
- Globally, the concept of graded approach shaped the work of inspections and audits planned by the regulatory bodies and

inspectors.

Application of the graded approach.

- No two similar graded approaches were presented. The practices were also different, as well as the national regulatory context and culture.
- Nonetheless this is a confirmation that there is no harmonized procedure and the graded approach is shaped on a case-by-case basis.
- Despite the large variety of cases, a global scheme can be drafted:
  - The focus is given to a practice or an existing exposure situation.
  - A baseline identification is performed – but not always – to decide if the exposure situation should enter in the RP regulation or not. A baseline radiological criteria (ex. 1 mSv/y) or a positive list can be used. In the other cases, all the facilities/companies are a priori entering in the process;
  - A methodology for ranking the facilities/companies is used. In general, the facilities/companies are ranked using 3 to 4 graduations (min. 2, max. 5).
  - The grading it-self applies, proportionate to the ranking. It can consider the work/process, the documentation, the training, the dosimetry etc. and control is exercise thought approval, the level of rigor and details, the frequency etc.

A proposed generic scheme for a graded approach based on these elements in presented Figure 2 next page.

Factors that can be considered for grading

- The factors to be considered for grading shows great variety:
  - In terms of number (from 1 criterion to many criteria, ex. 11);
  - Exact numbers and band of values;
  - Quantitative vs. qualitative criteria;
  - Criteria based on measurement when other are based on assessment, derived criteria, scenarios etc.
- Radiological criteria can be measured, expected or derived and show great variety: mSv, mSv/y, man.mSv, Bq/g, Bq/m^3 , (Bq.h/m3)/y, D value, etc.
- Non-radiological criteria have also been reported, for example :
  - the type of technology (ex. radiography);
  - the type of operation (in the industry),
  - or high level criteria (risk assessment, documentary analysis, international recommendation[4])
- Non-radiological criteria can be dominant, especially in existing exposure situations. Social and ethical factors may influence the decision (especially in existing exposure situations) and in some cases, may even supersede the others factors (e.g. pregnant women, legacy site end-state).

Good practices.

- When many different criteria are used, decision-aiding techniques such as scoring matrices, have been used and identified as good practice.
- The involvement of the professionals in the process is a key point. It is "*vital part to obtain cooperation and operability of new regulation*" and can be achieved via stakeholder meetings, consultation process, working group meeting. This also makes the process more transparent.
- The transparency can also be achieved by peer-reviewing (other Authorities) or public consultation.
- The graded approach should be a dynamic process taking into account the feedback of its implementation (ex. Ireland).
- Informatic tools can make a difference in a graded approach, such as easy-to-use website for declaration. The data can be more easly managed by the Authorities.
- Professionals will need support: outreach, communication, guidance documents etc. developed by the regulator ideally in collaboration with the professionals.

[4] Ex. IAEA CS-G-1.5 Publication

Potential issues

- The balance between reducing the regulatory control pressure on some facilities without compromising radiation protection overall was a major area for discussion. It can be discussed if the graded approach is necessary going toward optimisation of the exposure.
- The graded approach has the potential to lead to the exemption of installations/sectors from RP regulation. This is "*a big shift*" in regulatory model. It might be even not applicable due to regulatory cultural differences between countries. This re-emphasize the fact that the regulatory approach is not harmonized between countries.
- Explanation and communication are vital to ensure applicability of the approach and avoid confusion in which regulation is actually valid:
    - "*Regulators and operators are unclear about the requirements, this has resulted in* [the regulation] *becoming overly burdensome with no corresponding improvement on radiation safety*"
- Several possibilities have been identified to avoid this situation:
    - Communication strategy, consultation process,
    - New channels of communication Authority <> licensees, dedicated website (ex. Ireland),
    - Regulators involved in the co-construction of professional code of good practices (ex. Ireland)
    - Mobilize professionals societies and other networks

Specific issues in existing exposure situations

- The information/data used are sometimes based on conservative hypothesis, pessimistic scenario and predictive model. The better data quality comes from operating experience and field data.
- The baseline criterion is very often the 1 mSv/y exposure value, which is the dose limit for public exposure, seen as "a magic number".
- Applying a graded approach in existing exposure situations (NORM, radon) has the potential to put many workplaces in the RP scope and hence raise specific difficulties in terms of management, communication etc.
- Following on this idea, the graded approach should not be viewed as a step-by-step approach. As a metaphor, a graded approach can be regarded as a using a shelf or a rack to sort the exposure situations according to existing/potential exposure, when a step-by-step approach is more like entering in a tunnel and advancing *gradually*, but the end result cannot be predicted, ex. many new entrants in the regulation (radon at workplaces).
- The experience shows that the management of ionizing radiation in existing exposure situations should not be standalone and will benefit from a global approach: ie. radiation protection requirements should be integrated with the overall Health & Safety requirements at work and supported by a national control strategy.
- Aiming for an **integrated + graded approach** can be the topic of another brainstorming!

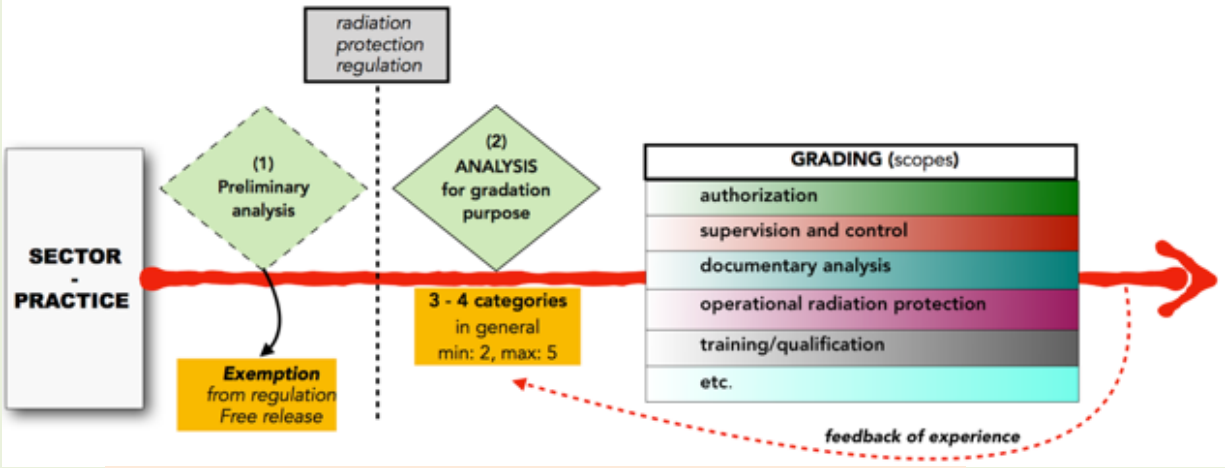


Figure 2. – Generic proposed scheme for a graded approach

Annexe. – Questionnaire used for the survey

The Euratom Directive 2013/59 introduced the concept of a graded approach for "regulatory control, which should be commensurate with the magnitude and likelihood of exposures resulting from a practice" (art. 24). The exemption, notification and authorisation – which include registration and licensing – are generally (but not systematically) the regulatory options under the graded approach.

The Members of the European ALARA Network (EAN) and the European Radiation Protection Authority Network (ERPAN) held a brainstorming meeting in December 2018 to discuss their understanding of the concept of a graded approach and their practical experience in implementation/application. The topic was limited to the protection of workers in workplaces. At the end of the meeting, it was proposed to initiate a survey to collect more examples and enrich the debate, notably by gathering the views of applicants and licensees.

The topics are restricted to the protection of workers in workplaces.

1. **What is the sector/activity you would like to describe?** please limit to 1 sector/activity: radiotherapy, transport, NORM, radon at work, etc.

2. **Is there a very 1st criteria ('baseline criteria' – if any) used to screen the sector/activity?** Ex. a risk assessment, expected doses > 1 mSv/y, exemption level, a list of practices found in literature, etc.

3. **After the baseline criteria (if any), what are the criterion/criteria used for the graduation? Can you provide examples of requirements attached to each level?** How many graduations? Are these radiation protection criteria only or are economic and societal aspects also considered? Is it one step process or step-by-step process?

4. **FOR REGULATORS: Did the implementation of the graded approach influenced your method for regulation?** Do you have good practice to report?

5. **For APPLICANT/LICENCE HOLDER: Did the implementation of the graded approach influenced your radiation protection practice and internal policy?** Do you have good practice to report?

6. **Do you see specific issues in a graded approach?** Could it be non-applicable in some cases and why? To many steps? Non-understandable in practice? And how to overcome?

7. **Has the graded approach for the sector/activity you report lead to some form of stakeholders involvements and/or communication campaign?** Was it sufficient (also for non-radiation specialists/industries)? Do you have good practice to report? ■

Contamination incidents during injection of radiopharmaceuticals

Translation:
Mr. S. Andresz, CEPN, France

N.B. This article is a translation from an incident reported to the OTHEA/RELIR database in June 2020. The incidents occurred in the Nuclear Medicine Department of a French installation.

Circumstances of the 2 incidents

Incident n°1

Tetrosfosmin is a ^{99m}Tc radiopharmaceutical used for myocardial imaging. A catheter of 22 Gauge (a unit to measure the diameter of the catheter, around 0.64 mm – cf. Figure 1) with a valve cap was used to perfuse a patient during a preliminary exam that took place in the morning (myocardial imaging under stress (effort)).

Figure 1. – Catheter

After the exam, Actor A rinsed the cap valve with a neutral solution in a syringe with a Luer-Lock attachment (using a screw-head for locking and regarded as secured when locked) before inserting a syringe of 2 mL of ^{99m}Tc (829 MBq) for a second exam. This syringe uses a Luer-simple connection.

The second exam was performed during the afternoon and for the same patient (at rest). When Actor A tried to perfuse the solution via the catheter, he felt a resistance and increased the pressure. The syringe was ejected and the radiopharmaceutical was projected in the room and splashed on Actor A (neck) and on the patient (clothes).

Actor A called Actor B for help to manage the contamination and take care of the patient.

- Actor A has immediately taken a shower (as requested by the procedure) and no contamination was detected on their person afterwards. Actor A's clothes were stored in a safe place to allow for radioactive decay.
- The Radiation Protection Officer ("Competent Person in Radiation Protection" under French Law, PCR) was alerted.
- The contaminated clothes of the patient were put in a bag and it was recommended to wash them separately after 3 days. Single-use clothes from the hospital were given to the patient and the second examination was finally performed.
- The contaminated area of the room was washed with a decontamination foam and a contamination check performed after.

Incident n°2.

A patient was fitted with a IV catheter of 22 Gauge and asked to begin the exercise stress test (using a stationary bicycle) (Figure 2).

Figure 2. – Ergometric bicycle

Actor A attempted to inject 3 mL of the radiopharmaceutical ^{201}Tl (120 MBq) using a syringe with a Luer-simple lock. Resistance was felt so Actor A pushed harder and increased the pressure on the syringe plunger. A leak occurred and the liquid covered Actor A, the patient, the bicycle and the floor.

Actor A called Actor B for help. In the course of action, Actor B walked on the contaminated floor and subsequently spread contamination into the corridor.

After discussion with the Nuclear Medicine Physicist, it was decided to inject another dose of radiopharmaceutical to the patient and to proceed to complete the nuclear medicine study.
Indeed the examination with ^{201}Tl shall be performed quickly after the injection, a myocardial imaging generally suffer no delays (emergency, treatment in course etc.) and furthermore imagining with ^{201}Tl is very rare, only performed after the specific request of the Cardiologist.

- The clothes of the patient were removed and stored away, and it was recommended to wash them separately after 3 days (to allow for decay).
- The PCR was not on-site and gave instructions by phone.
- Actor A removed his clothes and was checked for contamination. A urine analysis check was performed to assess uptake of ^{201}Tl because Actor A had open hand injuries (prior to the incident).
- The shoes of Actor B were stored safely for decay.
- The floor of the room and the corridor were decontaminated. The room was locked for 4 days to allow for decay.
- The decontamination of the bicycle was not easy because of unsmooth surfaces. Additional lead protection was installed.

Radiological consequences

Incident n°1

- Patient: no external contamination;
- Actor A: no contamination in the eyes but estimated of 19 µSv on the neck;

Calculation made by the PCR

200 cps were measured, which corresponded to an activity of 45,7 kBq based on the characteristics of the probe, 50 cm^2 of skin was contaminated, hence 914 Bq/cm^2.
With ^{99m}Tc, the dose rate is $2.5.10^{-1} \times 914 = 228,5$ µSv/h.
The contamination was on the skin for 5 min, hence 228,5 µSv/h × 5/60 h = 19 µSv.

- Room: partly contaminated

Incident n°2

- Patient: no external contamination;
- Actor A: no external contamination but internal contamination (urine sample: 12 Bq/L) arising from absorption via the pre-existing injuries on hand or inhalation of droplets of liquid;
- Room, floor, bicycle: partly contaminated.

Causes

- Human cause: no, except in incident n°2 were Actor A could have warned Actor B about the contamination of the floor;
- Connexion with Luer-simple syringe is fragile;
- The brand of syringe has a hard plunger (the brand was chosen because compatible with the rest of the equipment);
- Catheters of 22 G are more adapted for small veins (not adults), hence the difficulties to inject.

Improvements of practice

1. Use Luer-lock syringe which is compatible with the equipment;
2. Use catheters of 20 G (0.8 mm) for adults;
3. Place protection over ergonomic bicycle to ease decontamination;
4. Place shoe protection at the entrance of rooms were radiopharmaceuticals are used

Improvement of procedures

1. Follow the use instructions for the material;
2. Seek information if materials seem inadequate/not suitable; Be vigilant about feedback from the field;
3. Make personnel aware of incident (feedback);
4. Use protective equipment: gloves, glasses, shoe protection, if this adapted to the activity;
5. Consider easy to clean surface for room and bicycle (N.B. smooth surface cannot be used for security reason, ex. bicycle);
6. Emergency protocols should be established and known from the Actors and other personals: alert the PCR, take care of the patient, take care of the contaminated personnel, delineate the contaminated areas, decontaminate;
7. Plan and prepare emergency exercise. ■

A RADIOLOGICAL INCIDENT HAS OCCURED?

SHARE IT TO THE COMMUNITY
USE THE OTHEA/RELIR DATABASE
https://relir.cepn.asso.fr/en/

Image: The Broken Vase 1913, Ludwig Strimpl (1880-1937)

Action Plan to strengthen the radiological safety and security in Switzerland (Radiss)

TH. FLURY, A. SENN, R. LINDER, N. STRITT

Radiation Protection Division
Federal Office of Public health
Switzerland

The use of radioactive sources for diagnostic and therapeutic purposes in medicine contributes to saving lives. Their use is also highly beneficial and often indispensable for applications in research and industry. However, if radioactive sources become uncontrolled, they pose a danger to both human health and the environment and can cause great damage.
On the one hand, the risks include the malicious use of radioactive sources, which has come into the international spotlight after the attacks in 2001 and the persisting threat of terrorism. On the other hand, the uncontrolled proliferation of orphan sources via recovery and recycling poses a potential risk. In order to ensure global protection against these risks, Switzerland has adapted its legal basis in 2018. To strengthen the measures regarding the radiological safety and security, the Swiss government adopted the Action Plan "Radiss" 2020–2025.

The action plan Radiss aims to

- Prevent the misuse and terror with radioactive material,
- Prevent the uncontrolled proliferation of radioactive material,
- Prevent the exposure of the population and the environment to radioactive material,
- Prevent the illegal import and export of radioactive material,
- Limit the damage and ensure criminal prosecution after an incident.

The measures to achieve the goals include the strengthening of the security of radioactive sources, the increase of measurement capacities in recycling facilities and at borders in order to detect orphan and illegal radioactive sources and last but not least an efficient incident management.

In order to strengthen the security of radioactive sources, the Federal Office of Public Health (FOPH), in co-ordination with the relevant authorities in Switzerland and abroad, has elaborated a guideline describing the necessary security measures. The measures include intrusion detection systems, physical barriers, access restrictions and other operational measures that must be implemented by the facilities concerned. The supervisory authorities oversee and monitor the correct implementation of the security measures. Furthermore, alternative technologies, such as X-Ray irradiators are promoted as a replacement for high activity sealed radioactive sources since they do not pose a threat for malicious use.

To detect radioactive sources that are out of control as early as possible and where they are most likely to be found, measurement capacities are expanded in several hundred companies throughout Switzerland. Recycling companies such as waste incineration plants and scrap recycling companies are obliged to check waste and recycling materials for radioactivity upon receipt, transfer and export. In order to support the companies in this work, the supervisory authorities together with industry representatives have elaborated a guideline that describes the requirements and specifications of the measuring equipment and the procedures to secure radioactive sources. If illegal disposal cannot be ruled out, investigating authorities support the companies to determine and – if necessary - prosecute the owner or producer of the waste.

An orphan source
Credit: PNRI and IAEA

A further measure to strengthen the radiological safety in Switzerland is to monitor possible illegal

import, export and transit of radioactive material. To this end, the FOPH, in collaboration with the Federal Customs Administration (FCA), the Spiez Laboratory and the Paul Scherrer Institute PSI, coordinates mobile measurements and checks of radioactivity by setting priorities at major custom agencies and other strategic locations. These controls are to be intensified and expanded as part of the action plan.

In particular, the installation of permanent measuring equipment at selected locations such as parcel distribution centres or airports will first be evaluated and carried out in a second phase.
In the event of an incident, an efficient incident management system will help to minimise damages caused by sources that became uncontrolled. In the event of safety-relevant incidents involving high radioactive sources or following the discovery of orphan radioactive material, the processes between the concerned parties and authorities (licence holders, law enforcement, response units, as well as supervisory- licensing- and investigating authorities) must be well coordinated. International cooperation and the rapid exchange of information via the existing information channels of the International Atomic Energy Agency (IAEA: ITDB, INES) remain highly important.

Due to the broad distribution and the high-risk potential of radioactive sources, combined with the threat of international terrorism, radiological security is a key issue in radiation protection. At an international level, IAEA Member States must make progress in this area and meet a high standard of radiological safety and security in accordance with the recommendations of the IAEA. Switzerland intends to undergo an IAEA IPPAS mission in 2023 to evaluate the implementation of the required measures. In this context, international experts will assess the status of radiological security in Switzerland and, if necessary, formulate recommendations for further improvement.

An efficient and swift implementation of the necessary measures to strengthen the radiological safety and security requires cooperation between several federal departments. In this context, existing resources will be used in a coordinated manner and existing synergies will be optimally exploited. ■

Fukushima +10
A list of events

WHO REMPAN Webinar

In the context of the REMPAN Coordination network, the WHO REMPAN Webinar "Public Health consequences of Fukushima nuclear disaster: 10 years towards recovery" was dedicated to present the efforts of WHO with the Radiation Effects Research Foundation in Hiroshima, Nagasaki University, the National Institute of Radiological Sciences (QST) in Chiba, and Fukushima Medical University

The webinar was live on 23 March. A video recording is available here.

Fukushima 10 years on

A webinar on the **Health consequences of the Fukushima accident, 10 years on**, focused on two items: The health monitoring program of the evacuated population and affected population, and the thyroid screenings.

The webinar was organized by IRPA and EDF Radiation Protection Council and was live 6 April.

ICRP

ICRP has produced a statement on the work engaged by ICRP since the accident of which a key outcome was Publication 146 Radiological Protection of People and the Environment in the Event of Large Nuclear Accident (2020).

In addition, ICPR issued in 2020 Publication 146, Radiological protection of people and the environment in the event of a large nuclear accident: update of ICRP Publications 109 and 111. ICRP Publication 146.Ann. ICRP 49 (4). drawing on the feedback experience from the Chernobyl and Fukushima accidents.

Health management survey

In February, FMU (Fukushima Medical University) organized a symposium on the "**health management survey" with a focus on "What needs to be done to enhance the resilience of Fukushima's people".**

A particular focus was also given to the well-being and resilience of affected populations.

The videos are available on YouTube:

DAY 1 [9 hours], DAY 2 [10 hours]

Next event: at French SFRP

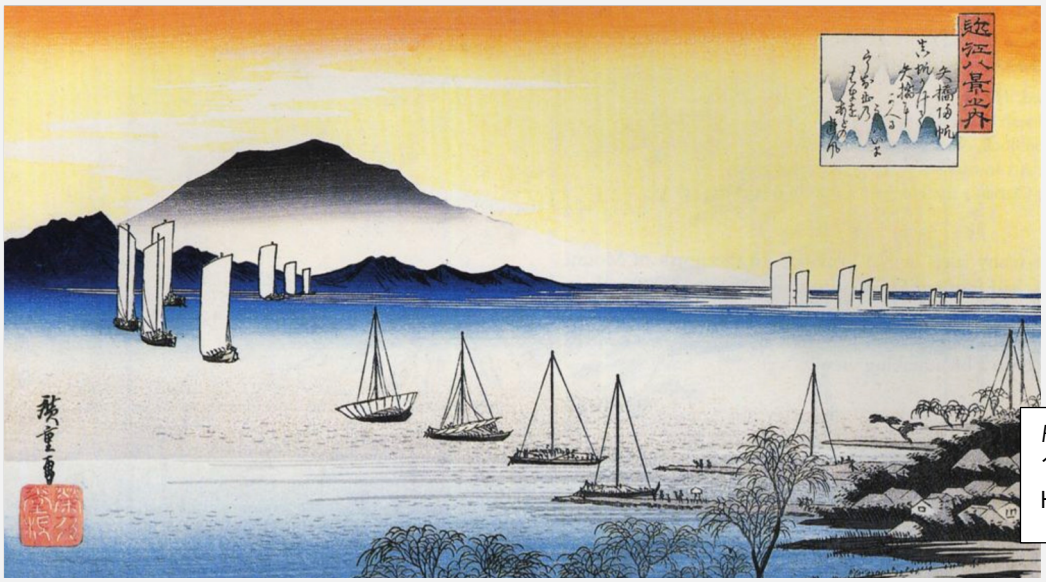
The national congress of the French Society for Radiation Protection (SFRP) 14-18 June (virtual) will host 2 guest speakers from Japan:

What is the social role of RP professionals and experts - 10 years of Radiological Protection after the Fukushima Daichi Nuclear Accident

M. Michiaki Kai (JHPS and ICRP)

Monitoring and supporting populations in Kawauchi (tentative tile), Noboru Takamura

Registration to the congress here.



Returning sails at Yabase
1st print 1834
Hiroshige (1797-1848)

REPORTS

UNSCEAR has published *Levels and effects of radiation exposure due to the accident at the Fukushima Daiichi Nuclear Power Station: implications of information published since the UNSCEAR 2013 report.*

In the report, the results of the update of the evaluation of dose to the thyroid is presented and an estimation of the impact of the protective measures on dose reduction, the current status of the survey on thyroid dose as well as a discussion on the use of collective dose in accident situations/risk estimation. The report and the content were presented live 9 March.
The report is available here

OECD NEA has published *Fukushima Daiichi Nuclear Power Plant Accident Ten Years On: Progress, Lessons and Challenges* about the response of the Japanese authorities and the international community since the accident. The report is addressed to policymakers in the first Instance but also deals with the multi-facets of the accident: radiation protection, plant decommissioning, waste management and psycho-social issues which Is accessible to a larger audience.
The report is available here.

IAEA Webinar on decommissioning

The IAEA Back End webinar series presented 24 March: *Fukushima Daichi Progress and Prospects on Decommissioning and Remediation*

In addition, you can watch the IAEA DG video's, Titled 10-year anniversary of Fukushima Daiichi Nuclear Power Plant Accident: A decade of Improving Nuclear Safety.

Article on tritium stored on site

What Can Radiation Protection Experts Contribute to the Issue of the Treated Water Stored in the Damaged Fukushima Daiichi Nuclear Power Plant?, Ichiro Yamaguchi, Department of Environmental Health, National Institute of Public Health, Wako, Japan Journal of Radiation Protection and Research 2021; 46(**1**): pp.24-31, 2021 https://doi.org/10.14407/jrpr.2020.00206 (Open Access).

COVID: what can past accident teach us?

This work of a team of experts (including M. Pascal Croüail, EAN Vice Chairman) published by IS Global (Spain) draw a parallel on the application of the recommendations from the SHAMISEN project on past accident to the Covid-19 pandemic. It is striking to see how the recommendations dealing with preparedness, managing uncertainties, the communication to the public by the authorities/ experts, the treatment of infected/contaminated persons are very much applicable. Furthermore, ethical values such as trust, confidence and sound decision-making found echoes in both situations. ■

Kajikazawa (in the Kai Province)
In 36 Views of the Fuji Mountain
1st print 1830-1832
Hokusai (1760-1849),

Lorem Ipsum

Trenz Pruca

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THIS CAN BE YOUR ARTICLE

Do you have practices in ALARA to share?
change in regulation?
event to broadcast?
....

Contact the Editorial Board

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Life of EAN and relationships with other networks

A new Member

Do you remember the circumference of the Large Hadron Collider? (27 km) or the discovery of Higgs boson?
The EAN is very happy to welcome the Health, Safety and Environmental protection (HSE) Unit, Radiation Protection (RP) Group of CERN as a new Administrative Board Member!
Dr. Stefan Roesler, Head of the RP Group and Deputy Head of the HSE Unit will be representing CERN at the EAN..

Strategic Agenda 2021-2026

The EAN has worked hard to produce its Strategic Agenda for the 2021-2016 period. After presenting the network's view on the context surrounding radiation protection and the application of ALARA, the document lays down the key topics and actions the network would like to engage.
The Strategic Agenda is laid out in 4 chapters:

1. Focusing on key ALARA themes,
2. Collaboration and partnership,
3. Communication and visibility,
4. Running the network.

Next EAN communications

May. The EAN will participate to the 3rd IRPA-SFRP workshop on Tolerability and Reasonableness, 4-5 May. The virtual workshop will question whether the tolerable risk model from ICRP Publication 60 remains valid for planned exposure situations and what constitutes the line between unacceptable and tolerable when dose limits do not apply.

June. Mr. Fernand Vermeersch, Chair, will present the 'EAN 25 years of European Collaboration' at the congress of French Society of Radiation Protection in June 2021. This follows a previous publication on the topic: *The European ALARA Network, activities and outputs*, F. Vermeersch, P. Croüail, J. Morgan, N. Stritt and S. Andresz, communication to national radiation protection societies, SCK • CEN January 7, 2021.

African ALARA Network (AFAN)

The AFAN and IAEA gave a webinar on **radiation protection optimization in industrial radiography** Wednesday, April 14, 2021 11:00 am (EST); duration: 1h30. Another workshop is planned by the end of April

EUTERP

EUTERP Foundation on Training and Education celebrates its 10's year anniversary in 2021.
Congratulation to the network!

In March 2021, EUTERP, IRPA and IAEA planned the ETRAP-2021 conference on Education and Training in a Virtual Setting.
Please check the ETRAP website for regular updates on the transactions of the conference material (recordings, proceedings, …) and the next ETRAP meeting in 2023.

ISOE

The ISOE International Symposium organised by ETC in France originally planned for 2020 will be pushed back again to 2022. However, a **virtual Symposium will be organized June 1 to 3, 2021**. In addition, the Radiation Protection Manager meeting and Regulatory Bodies meetings will be organised for May 31 (1/2 day each). The programme of the symposium is under construction. Check the ISOE Website for the latest information. ■

Contacts

European ALARA Network Contact Persons

AUSTRIA
Franz KABRT
Osterreichische Agentur fur Gesundheit und Ernahrungssicherheit GmbH
Spargelfeldstraße 191, 1220 WIEN
Tel.: +43 (0)5 0555-32922 |
E-mail: franz.kabrt@ages.at

BELGIUM
Fernand VERMEERSCH
SCK•CEN
Boeretang 200, 2400 MOL
Tel: +32 14 33 28 53; Fax: +32 14 32 16 24
E-mail: fvermeer@sckcen.be

CROATIA
Mladen NOVAKOVIC
Radiation Protection Authority – EKOTEH Dosimetry
Vladimira Ruzdjaka 21, 10000 ZAGREB
Tel: +385 1 604 3882; Fax: +385 1 604 3866
E-mail: mlnovako@inet.hr

CZECH REPUBLIC
Jan KROPACEK
State Office for Nuclear Safety,
Syllabova 21, 730 00 OSTRAVA
Tel: +420 596 782 935; Fax: +420 596 782 934
E-mail: jan.kropacek@sujb.cz

DENMARK
Kresten BREDDAM
National Institute for Radiation Protection
Knapholm 7, 2730 HERLEV
Tel: +45 44 54 34 63
E-mail: krb@sis.dk

FINLAND
Maaret LEHTINEN
Säteilyturvakeskus – Radiation Practices Regulation
Laippatie 4, 00880 HELSINKI
Tel: +358 9 75988244 Fax: +358 9 75988248
E-mail: maaret.lehtinen@stuk.fi

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ISSN 1270-9441
c/o CEPN
28, rue de la Redoute
F-92260 Fontenay-aux-Roses
http://www.eu-alara.net

FRANCE
Paul LIVOLSI
Institut National des Sciences et Techniques Nucléaire, Commissariat à l'Energie Atomique (CEA/INSTN),
17 rue des Martyrs 38054 GRENOBLE Cedex 9
Tel: +33 4 38 78 39 27; Fax: +33 4 38 78 51 01
E-mail: paul.livolsi@cea.fr

FRANCE
Pascal CROÜAIL
Nuclear Protection Evaluation Centre),
28 rue de la Redoute 92260 FONTENAY-AUX-ROSES
E-mail: pascal.crouail@cepn.asso.fr

GERMANY
Ulrike Kulka
Bundesamt für Strahlenschutz,
Ingolstädter Landstrasse 1, 85764 OBERSCHLEISSHEIM
E-mail: UKulka@bfs.de

GREECE
Sotirios ECONOMIDES
Greek Atomic Energy Commission
P.O. Box 60228, 15310 AG-PARASKEVI
Tel: +30 210 6506767; Fax: +30 210 6506748
E-mail: sikonom@eeae.gr

ICELAND
Geislavarnir Ríkisins
Rauðararstigur 10, 150 REYKJAVIK
Tel: +354 552 8200; Fax: +345 552 8202
E-mail: ge@gr.is

ITALY
Cristina NUCCETELLI
Istuto Superiore di Sanità – Technology and Health Department
Viale Regina Elena 299, 00161 ROME
Tel: + 39 06 4990 2203; Fax: +39 06 4990 2137
E-mail: cristina.nuccetelli@iss.it

IRELAND
Hugh SYNNOTT
Environmental Protection Agency,
Office of Radiological Protection
3 Clonskeagh Square, Clonskeagh Road, DUBLIN 14
Tel: +353 1 206 69 46; Fax: +353 1 260 57 97
E-mail: h.synnott@epa.ie

SLOVENIA
Selma FIJULJANIN
Slovenian Radiation Protection Administration
Langusova 4, 1000 LJUBLJANA
E-mail: Selma.Fijuljanin@gov.si

SPAIN
Arturo PEREZ MULAS
Consejo de Seguridad Nuclear
Justo Dorado 11, 28040 MADRID
Tel: +34 91 346 02 62; Fax: +34 91 346 03 16
E-mail: apm@csn.es

SWEDEN
Petra Hansson
Stralsäkerhetsmyndigheten,
17116 STOCKHOLM
Tel: +46 8 799 44 38
E-mail: Petra.Hansson@ssm.se

SWITZERLAND
Stefan ROESLER
Centre Européen de Recherche Nucléaire (CERN)
Groupe Radioprotection, Unité Santé, Sécurité et Environnement
Esplanade des Particules, P.O. Box 1211 GENEVA 23
E-mail: Stefan.Roesler@cern.ch

SWITZERLAND
Nicolas STRITT
Swiss Federal Office of Public Health,
Radiation Protection Division,
3003 BERN
Tel: +41 31 324 05 88; Fax: +41 31 322 83 83
E-mail: nicolas.stritt@bag.admin.ch

THE NETHERLANDS
Folkert DRAAISMA
NRG
Utrechseweg 310 B50-West,
6812 ARNHEM
E-mail: draaisma@nrg.eu

UNITED KINGDOM
Julie MORGAN
Public Health England – Centre for Radiation, Chemical and Environmental Hazards, Chilton
DIDCOT – OX11 0RQ
Tel: +44 1235 825301
E-mail: julie.morgan@phe.gov.uk