

Explanation Screening Meeting

Chapter 15 Energy

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RADIATION PROTECTION

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Chapter 3 Euratom and Secondary legislation

1. Protection of Workers

2. Protection of the Population

3. Environmental monitoring

4. Emergency Preparedness

EURATOM TREATY

◆ PREAMBLE

- « Anxious to create the conditions of safety necessary to eliminate *hazards to the life and health of the public* »

◆ THE BASIS

- «In order to perform its tasks, the Community shall ... establish uniform safety standards *to protect the health of workers and of the general public* and ensure that they are applied » (Article 2, b))

Directive 96/29
basic safety standards (BSS)

Directive 97/43
Medical
exposures

Foodstuffs
Regulations
(future
accidents)

Ecurie
Decision
87/600

Directive
90/641
Outside
workers

Shipments of
radioactive waste
and substances
Directive 92/3 +
Regulation
No 1.493/93

Directive
89/618
public
information

Directive 2003/12
control of
radioactive source
(HASS)

DIRECTIVE 96/29 - BSS

Title I Definitions

Title II Scope

Title III **Reporting and authorisation** of practices

Title IV **Justification, optimisation** and **dose limitation** for practices

Title V Estimation of effective dose

Title VI Fundamental principles governing **operational protection of exposed workers**, apprentices and students for practices

Title VII Significant increase in exposure due to **natural radiation sources**

Title VIII Implementation of **radiation protection for the population** in normal circumstances

Title IX **Intervention**

Title X Final provisions

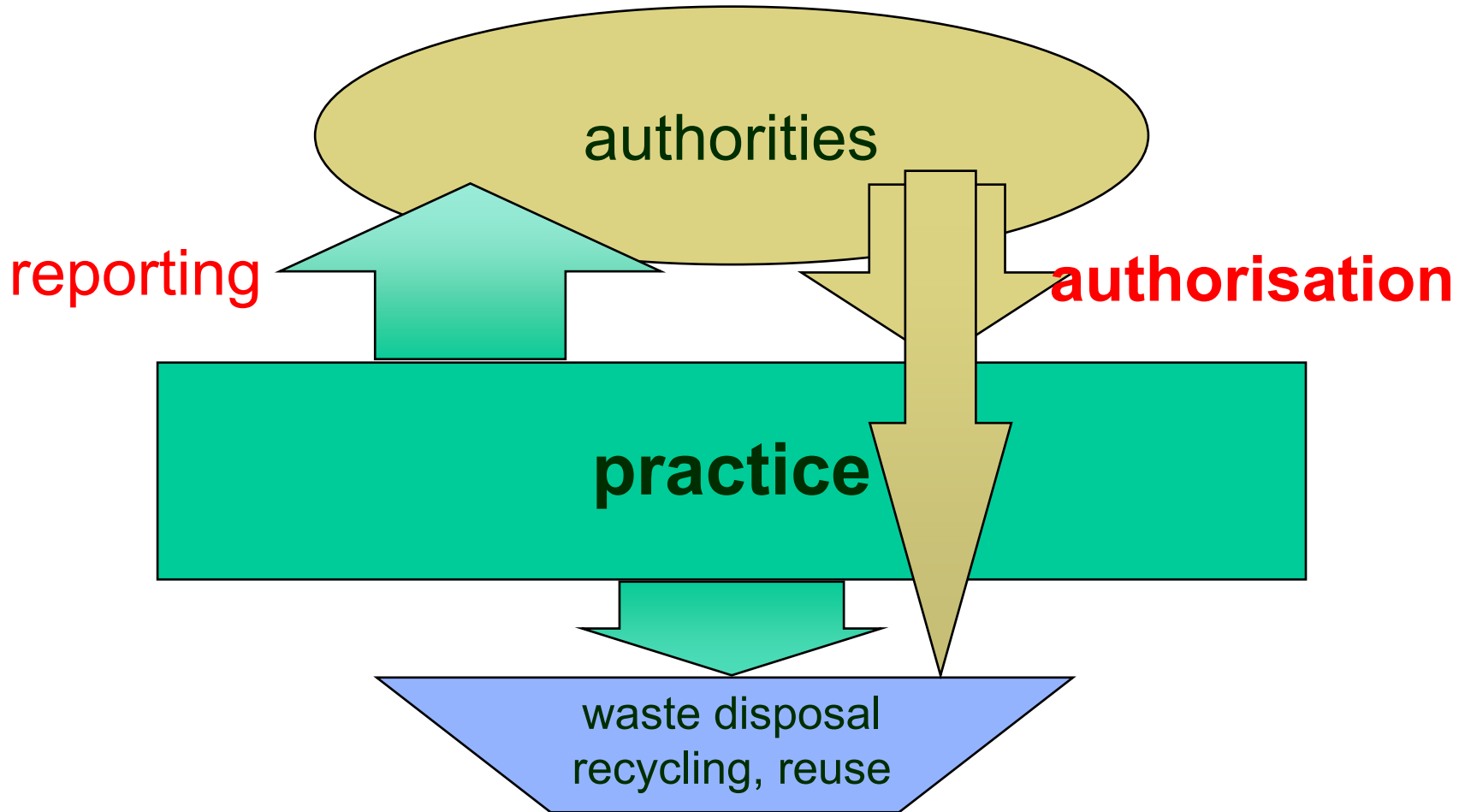
DIRECTIVE 96/29 - Scope

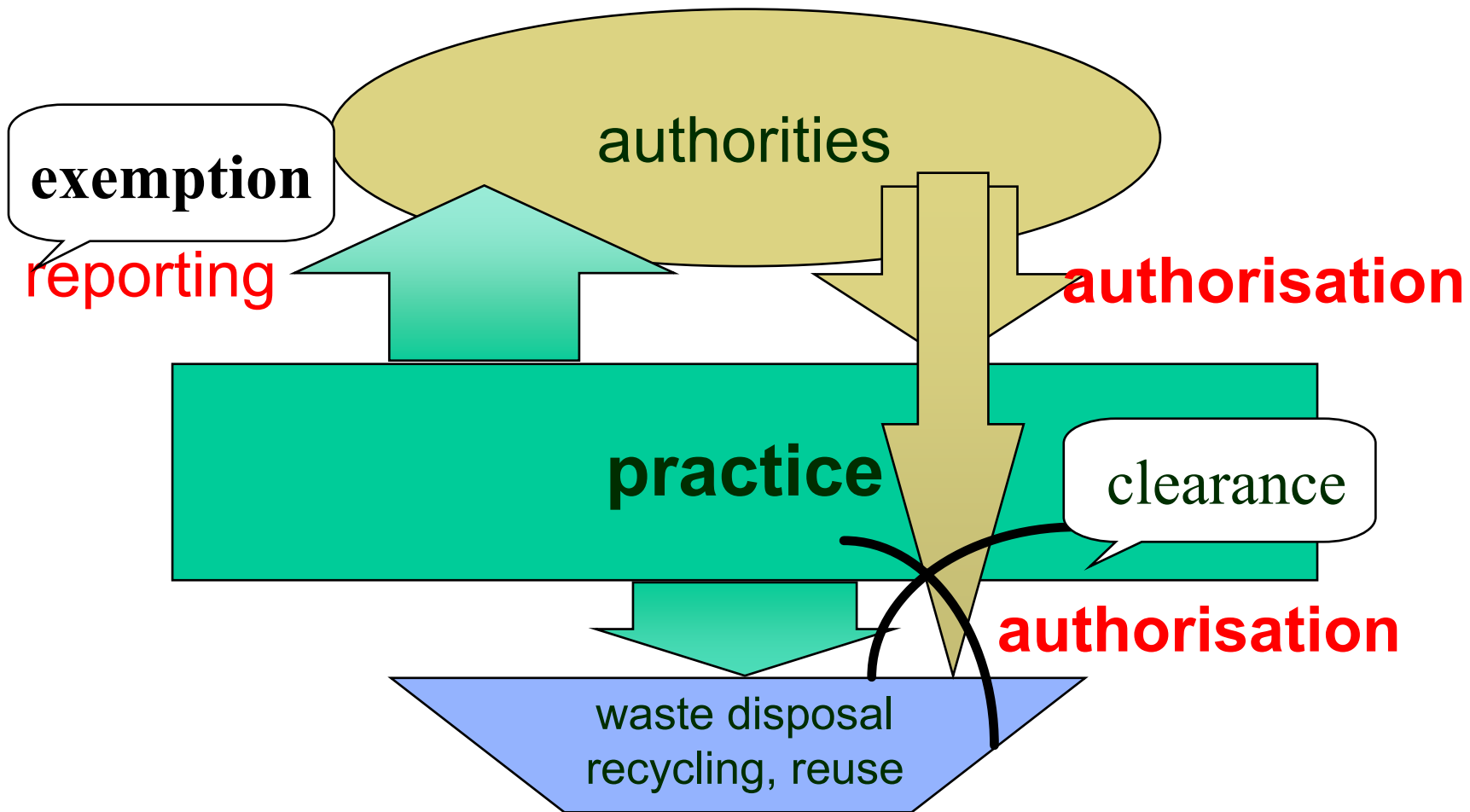
The Directive applies to:

- ◆ practices, human activities that can increase the exposure of individuals to radiation from an artificial source
- ◆ work activities, involving the presence of natural radiation sources that lead to a significant increase in the exposure of workers and population that cannot be disregarded from the radiation protection point of view
- ◆ intervention situations, human activities that aim at preventing or decreasing the exposure of individuals to radiation from sources which are not part of a practice or which are out of control (emergencies and past practices).

Reporting and authorisation

- ◆ **Reporting of practices**, except if quantities or concentrations below exemption levels
- ◆ **Authorisation**
 - nuclear fuel cycle
 - construction, operation and decommissioning
 - exploitation and closure of uranium mines
 - deliberate addition of radioactive substances
 - medicinal products
 - consumer goods
 - persons, animals
 - Industrial or therapeutical:
 - X-ray, accelerators, sources





Radiation protection principles

JUSTIFICATION

- The detriment from exposure should be justified by the benefit resulting from the class or type of practice (no frivolous applications of ionizing radiation)
- New practices need to be justified in advance by their economic, social or other benefits in relation to the health detriment they may cause
- Deliberate addition of radioactive substances in the production of foodstuffs, toys, personal ornaments and cosmetics and the import or export of these products is NOT justified and are therefore expressly prohibited

OPTIMISATION

- all exposures shall be kept As Low As Reasonably Achievable (ALARA principle), economic and social + other factors being taken into account.

DOSE LIMITATION

- the sum of the doses from all relevant practices shall not exceed the dose limits laid down in the Directive for exposed workers, apprentices and students, and members of the public.

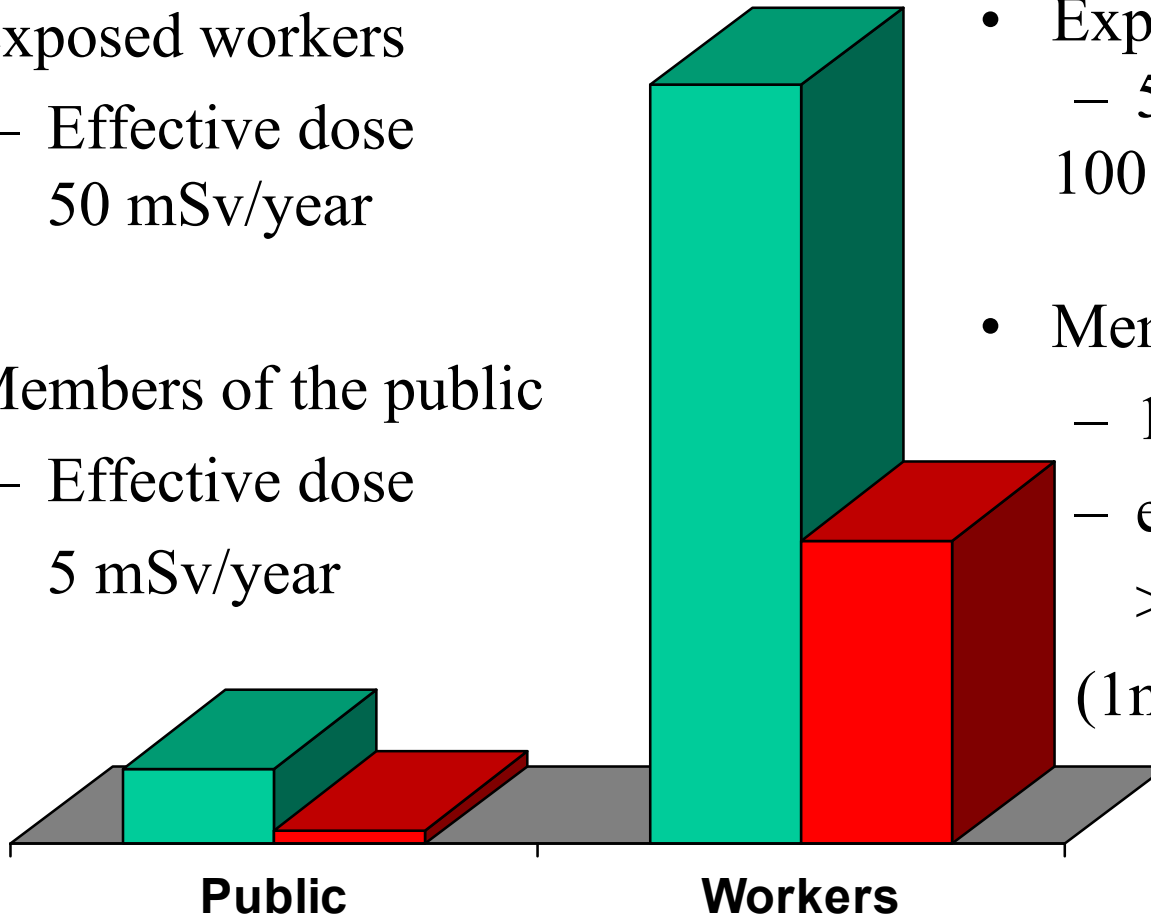
Dose limits

1980

- Exposed workers
 - Effective dose
50 mSv/year
- Members of the public
 - Effective dose
5 mSv/year

1996

- Exposed workers
 - 50 mSv/year
 - 100 mSv/ 5 years
- Members of the public
 - 1 mSv/ year
 - exceptionally
>1 mSv
(1mSv / 5 years)



Workers - Operational protection - Title VI BSS

FUNDAMENTAL PRINCIPLES

- ◆ **Prior evaluation** to identify the nature and magnitude of the radiological risk to exposed workers and implementation of the optimization of radiation protection in all working conditions.
- ◆ **Classification of workplaces.**
 - “Controlled areas” = an area subject to special rules – e.g. restricted access, special signs and working protocols- for the purpose of protection against ionizing radiation or of preventing the spread of radioactive contamination and to which access is controlled)
 - “Supervised areas” = an area subject to supervision for the purposes of radiation protection.
- ◆ **Classification of workers**
 - Category A : exposed workers liable to receive an effective dose greater than 6 mSv / year
 - Category B: the other exposed workers (>1 mSv/year).

Workers - Operational protection - Title VI BSS FUNDAMENTAL PRINCIPLES

◆ Category A

- ◆ liable to receive 6 mSv
 - individual monitoring
 - monitoring for internal contamination
 - medical surveillance
 - prior to employment
 - at least once a year
 - records > +30y - 75y

◆ Category B

- monitoring sufficient to demonstrate correct classification
- individual monitoring may be required

Workers – Outside workers

Directive 90/461/Euratom

- ◆ “Outside workers” are category A workers performing activities in a controlled area and who are either **employed by an external organisation** or are providing services as a **self-employed** worker.
- ◆ performance of activity by outside undertaking shall be subject to prior reporting and authorization.
- ◆ shall ensure that radiation protection for outside workers is equivalent to that for permanently employed workers
- ◆ a uniform reporting and recording system shall be established in a form of a computer network.
- ◆ meanwhile an individual radiological monitoring document shall be issued : Radiation Passbook

Workers – “Work activities” – Title VII BSS

- ◆ Work activities that are not “practices” and that involve the presence of **natural radiation sources** and lead to a **significant increase in the exposure** of workers or members of the public which cannot be disregarded from the radiation protection point of view
- ◆ Member States need to follow three steps:
 - Identification of those work activities that are of radiological concern.
 - Monitoring of the level of exposure and, if necessary, implementation of corrective measures
 - Monitoring of the level of exposure and if necessary, application of the radiation protection measures of the BSS for practices.
- ◆ **Air crew** liable to be subject to exposure of more than 1mSv/year. Undertakings shall take the appropriate measures e.g. to assess their exposure, to take this information into account when organising working schedules and to apply the provisions on special protection during pregnancy and breastfeeding to female aircrew.

Workers – Education and Training

Exposed workers

- Information on risks (procedures, precautions) ; need to comply with technical, medical and administrative rules ; Need for early declaration of pregnancy ; Training on Radiation Protection (BSS)
- Safe management of high activity sealed sources / possible consequences of loss of control (HASS Directive)

Other workers

- **Air crew** : information on cosmic radiation/BSS)
- **Intervention teams** (risks and precautionary measures BSS)
- **Workers of places where “orphan sources” may appear**: scrap metal yards, recycling plants, customs, etc. (HASS Directive)
- **Medical staff** : theoretical and practical training / continuing education and training – new techniques – medical and technical schools (MED)

Population – Normal circumstances

Title VIII Directive 96/29/Euratom

- ▶ **Operational protection of the population from practices subject to prior authorisation**
 - **examination and approval of plans for installations and siting**
 - **acceptance into service of new installations subject to adequate protection against exposures or radioactive contamination beyond the perimeter, taking into account demographic, meteorological, geological, hydrological and ecological conditions;**
 - **examination and approval of plans for the discharge of radioactive effluents**
- ▶ **Estimates and records of population doses as realistic as possible for the population as a whole and for reference groups of the population**
- ▶ **Records to be kept relating to measurements of external exposure, estimates of intakes of radionuclides and radioactive contamination as well as the results of the assessment of the doses received by reference groups and by the population**

Population – Foodstuffs regulations

▶ POST-CHERNOBYL REGULATIONS

- **Regulation (EEC) No 737/90** on the conditions governing imports of agricultural products originating in third countries following the accident at the Chernobyl nuclear power station (as amended and supplemented) : conditions for imports of specified agricultural products from third countries / maximum permitted levels of radio-active contamination
- **Recommendation 2003/274/Euratom**, on the protection and information of the public with regard to exposure resulting from the continued radioactive caesium contamination of certain wild food products as a consequence of the accident at the Chernobyl nuclear power station

▶ FUTURE ACCIDENTS

- **Regulation (Euratom) No 3954/87** : maximum levels of radio-active contamination that are allowed to be present in any foodstuffs and feeding-stuffs that may be placed on the market following a nuclear accident or other radiological emergency (as supplemented)

Population – Medical exposures

Directive 97/43/Euratom, of 30 June 1997, on health protection of individuals against the dangers of ionizing radiation in relation to medical exposure, and repealing Directive 84/466/Euratom –

- Scope
- Radiation protection principles
- Responsibilities
- Procedures
- Equipment
- Special practices

Population – Medical exposures – SCOPE

Directive 97/43 applies to exposures to

- ◆ **patients**
- ◆ **In the context of occupational health surveillance;**
- ◆ **In the context of health screening programmes;**
- ◆ **in the context of so-called “medico-legal procedures”;**
- ◆ **healthy individuals or patients voluntarily participating in medical research programmes; and**
- ◆ **individuals who knowingly and willingly help (“carers”)**

Population – Medical exposures – PRINCIPLES

JUSTIFICATION

- General: all new practices involving medical exposure shall be justified in advance before being generally adopted (alternative techniques?)
- Individual If a type of practice is not justified in general, a specific individual exposure of this type could nevertheless be justified in special circumstances to be evaluated on a case by case basis.
- Prescriber and practitioner involved – avoid unnecessary exposure
- Special attention to justification of medical exposures where there is no direct health benefit for the person undergoing the exposure (research), and especially for so called "medico legal exposures"

Population – Medical exposures – PRINCIPLES

OPTIMISATION

- ◆ **radiodiagnostic procedures** : “doses shall be kept as low as reasonably achievable consistent with obtaining the required diagnostic information, taking into account economic and social factors”
- ◆ **radiotherapeutic procedures** : “exposures of target volumes shall be individually planned, taking into account that doses of non-target volumes and tissues shall be as low as reasonably achievable and consistent with the intended radiotherapeutic purpose of the exposure”
- ◆ Particular requirements for exposures such as healthy individuals exposed during medical or biomedical research, individuals willingly and knowingly helping patients. Special attention shall be given to optimisation for medico-legal exposures.

Directive 2003/122/Euratom, on the control of high activity sealed radioactive and orphan sources (HASS)

OBJECTIVE:

- ◆ to prevent exposure to ionising radiation arising from inadequate control of high activity sources (protection of workers and population)
- ◆ to harmonize controls in place in the Member States by setting out specific requirements ensuring that each source is kept under control (*source traceability*)

Directive 2003/122/Euratom, on the control of high activity sealed radioactive and orphan sources

- ◆ **Prior authorization, subject to :**
 - **adequate arrangements for the safe management of sources, including when they become disused**
 - **including financial provision for their safe management when sources become disused**
- ◆ **Records of holders and sources**
- ◆ **Holders obligations**
- ◆ **Identification and marking**
- ◆ **Orphan sources – financial provision**
- ◆ **Enforcement measures**

Regulation (Euratom) No 1493/93 on Shipments of Radioactive Substances between Member States

Administrative procedure applicable to shipments between Member States of **radioactive sealed sources** and **other relevant sources** whenever the defined quantities and concentration levels are exceeded;

The holder shall obtain written declaration that receiver complies with BSS provisions.

The receiver informs the national competent authority, confirmation to be returned to the holder;

Standard document to be used, **competent authorities** officially nominated and published

Directive 92/3 - Shipments of Radioactive Waste between Member States and Into and Out of the Community (Shipments Directive)

Scope:

Administrative procedure applicable to shipments of **radioactive waste** whenever the defined quantities and concentration levels are exceeded (Dir 96/29/Euratom).

Use of a Standard Document

Competent authorities officially nominated and published in the **Official Journal**

ENVIRONMENTAL SURVEILLANCE

Title II, Chapter 3, Euratom

- ◆ **Article 35: Environmental monitoring / right of access to the Commission**
- ◆ **Article 36: Environmental monitoring data - transmission to the Commission**
- ◆ **Article 37: Planned disposal of waste /impact on neighbouring Member States - transmission of general data - Commission opinion within 6 months**

Environmental monitoring and reporting

Articles 35 and 36 Euratom

- ◆ **Article 35** - Member States to establish the facilities necessary to carry out *continuous monitoring of the level of radioactivity in the air, water and soil*
- = infrastructures + internal organizational provisions / national responsibilities to be defined!!
- ◆ **Article 36**, information resulting from these checks shall be periodically communicated to the Commission, so that it is kept informed of the level of radioactivity to which the public is exposed.
 - **Recommendation 2000/473/Euratom**, on the application of Article 36 of the Euratom Treaty concerning the monitoring of the levels of radioactivity in the environment for the purpose of assessing the exposure of the population as a whole

Environmental monitoring and reporting

Articles 35 and 36

Article 35 Verifications

- ◆ **Commission's right of access to the facilities established by the Member States to carry out continuous monitoring of the level of radioactivity in the environment and may verify their operation.**
- ◆ **Objective: to establish the efficiency of the facilities installed for the measurement of environmental radioactivity and of radioactive discharges, and to establish the adequacy of the environmental monitoring programme.**
- ◆ **Verifications are initiated (a) where and when the Commission estimates it to be appropriate; (b) on request (invitation) of national authorities; (c) on request of the European Parliament; (d) on request of a Member State (to verify a neighbouring Member State).**

Article 37 submissions – Disposal of radioactive waste

- ◆ **General data relating to any plan for the disposal of radioactive waste in whatever form as will make it possible to determine whether the implementation of such plan is liable to result in the radioactive contamination of the water, soil or airspace of another Member State.**
- ◆ **Commission opinion within six months, after consulting the Article 31 Group of Experts.**
 - ***Commission Recommendation 1999/829/Euratom: Installations related to the nuclear fuel cycle / management of radioactive waste / handling and processing of radioactive substances on an industrial scale / work activities considered as being of concern by the Member States***

Emergency Preparedness

- ◆ **Title IX of Council Directive 96/29 - “Intervention”**
- ◆ **ECURIE - European Community Urgent Radiological Information Exchange**
- ◆ **Directive 89/618/Euratom on informing the general public about health protection measures to be applied and steps to be taken in the event of a radiological emergency**

Emergency Preparedness – Title IX BSS

“Intervention preparation”: Intervention plans at national or local level, including within installations, to be tested at regular intervals. Special teams for technical, medical and health intervention.

Implementation of the intervention: Immediate notification by the operator to the national authorities / Need for appropriate action / Organisation of appropriate intervention / Assessment and recording of the consequences of the radiological emergency and the effectiveness of the intervention.

“Lasting exposures” resulting from radiological emergencies, or from past practices or work activities. Member States to take appropriate measures: demarcating the area concerned, monitoring of exposure, intervention measures or restrictions in access to the area.

Basic principles of intervention Specific wording

ECURIE

European Community Urgent Radiological Information Exchange

Decision 87/600/Euratom on Community arrangements for the early exchange of information in the event of a radiological emergency

EU Member States, Bulgaria, Romania and Switzerland
(Turkey) (Croatia ?)

Notification and provision of information whenever a Member State decides to take measures of a wide-spread nature in order to protect the general public in case of a radiological emergency

Interaction with IAEA : Joint Radiation Emergency
Management Plan of the International Organisations

PUBLIC INFORMATION

- ▶ **Directive 89/618/Euratom** on informing the general public about health protection measures to be applied and steps to be taken in the event of a radiological emergency
- ▶ Minimum information contents and way of transmitting the information before and during an emergency
- ▶ Two types of information:
 - preventive information to be given to the population groups for which Member States have drawn up intervention plans in the event of a radiological emergency;
 - information in the event of a radiological emergency, to be given to the population groups actually affected in the event of a radiological emergency and for which specific protection measures are taken.

Web site

http://europa.eu.int/comm/energy/nuclear/radioprotection/legislation_en.htm

