IRSN
INSTITUT
DE RADIOPROTECTION
ET DE SÛRETÉ NUCLÉAIRE

EMRAS II – WG 1 “Controlling Discharges” French Civil Nuclear Context

22-25 September 2009 / IAEA Vienna

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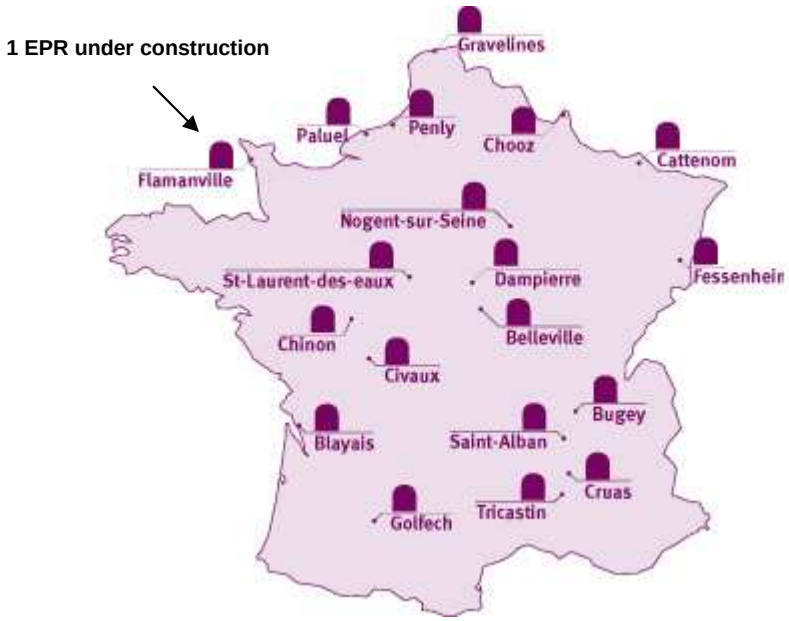
PLAN

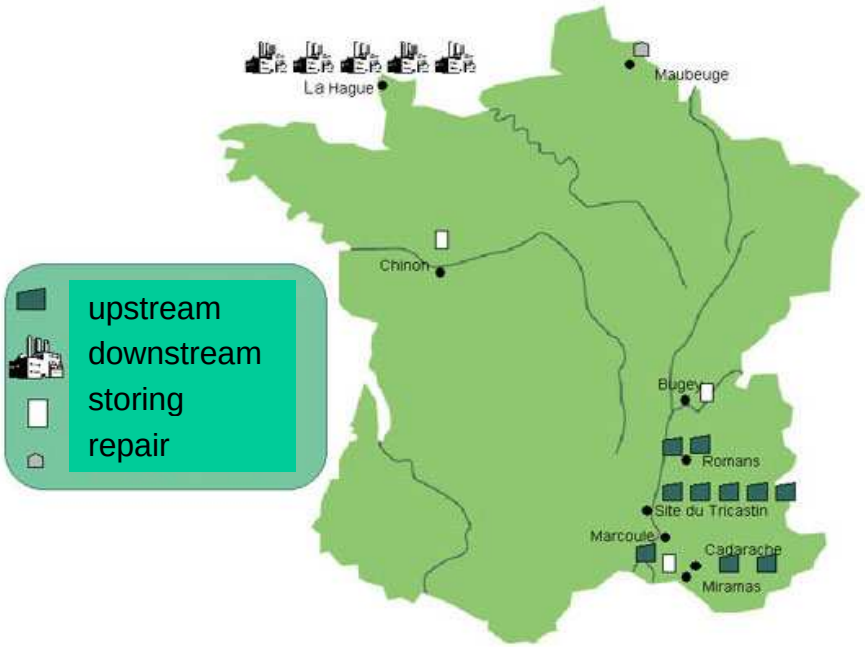
- Civil Nuclear Activities
- Regulatory Limit Values
- Regulatory Framework
- Modelling approaches

Civil Nuclear Activities

1. Nuclear Fuel Cycle



58 reactors, 19 nuclear power plants
75% of the electricity production
(EDF)



Upstream and downstream installations
(AREVA mainly)

Civil Nuclear Activities

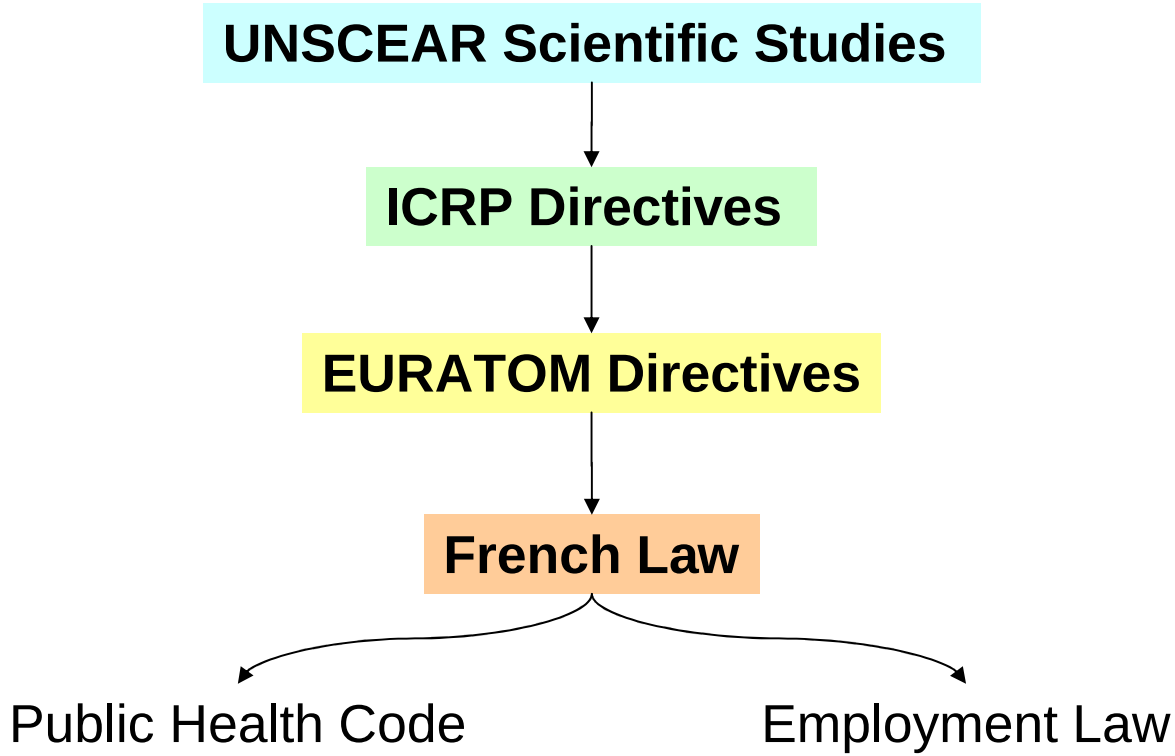
2. Research installations operated by CEA, CNRS, ILL, ITER.

3. Radiological and biomedical activities
Radiology, scanography, radiation therapy, curietherapy…

4. Industrial activities
Industrial irradiation, non-destructive controls, measurement devices...

5. Transport of radioactive materials
≈ 900.000 parcels per year

Regulatory Limit Values

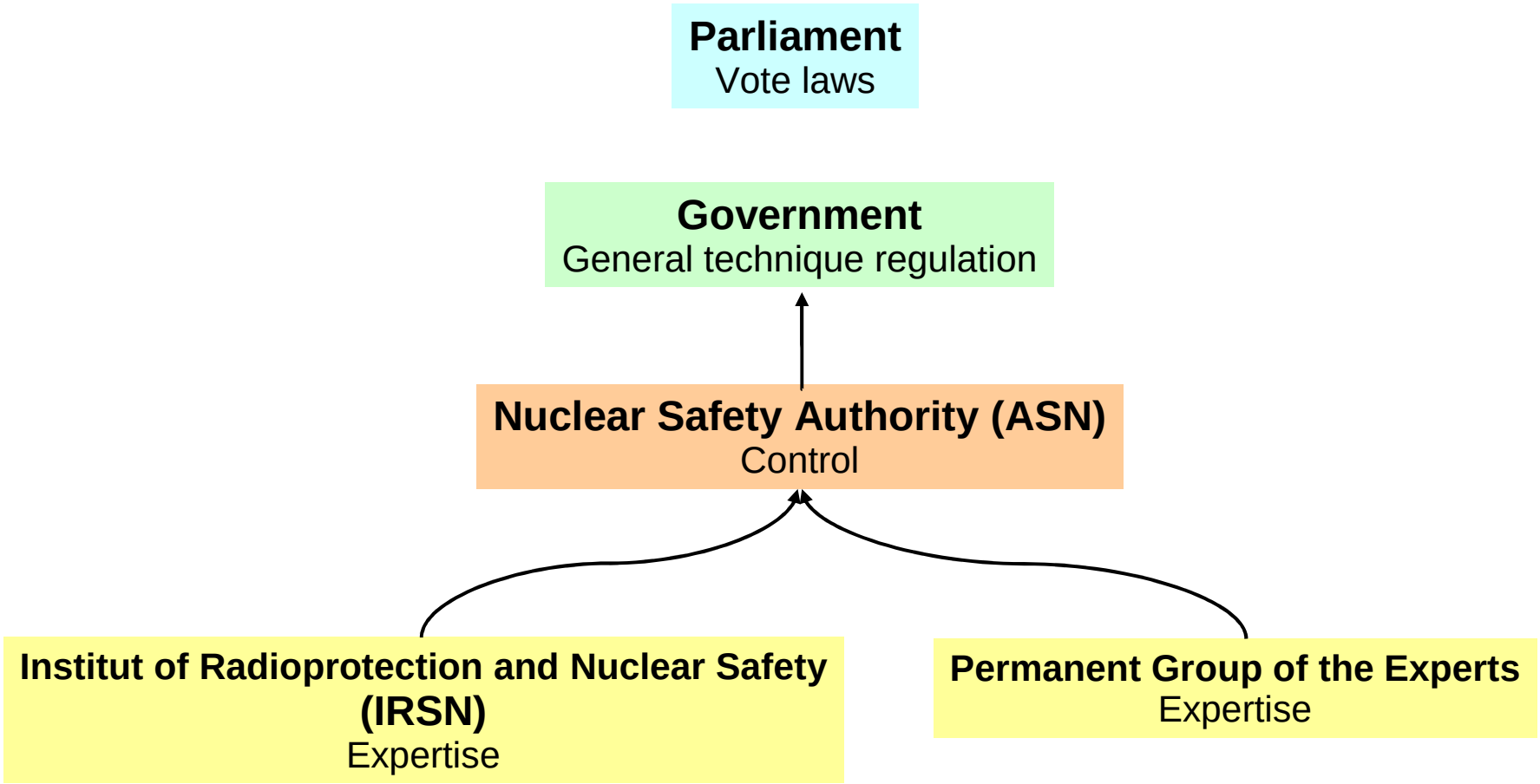


Regulatory Limit Values

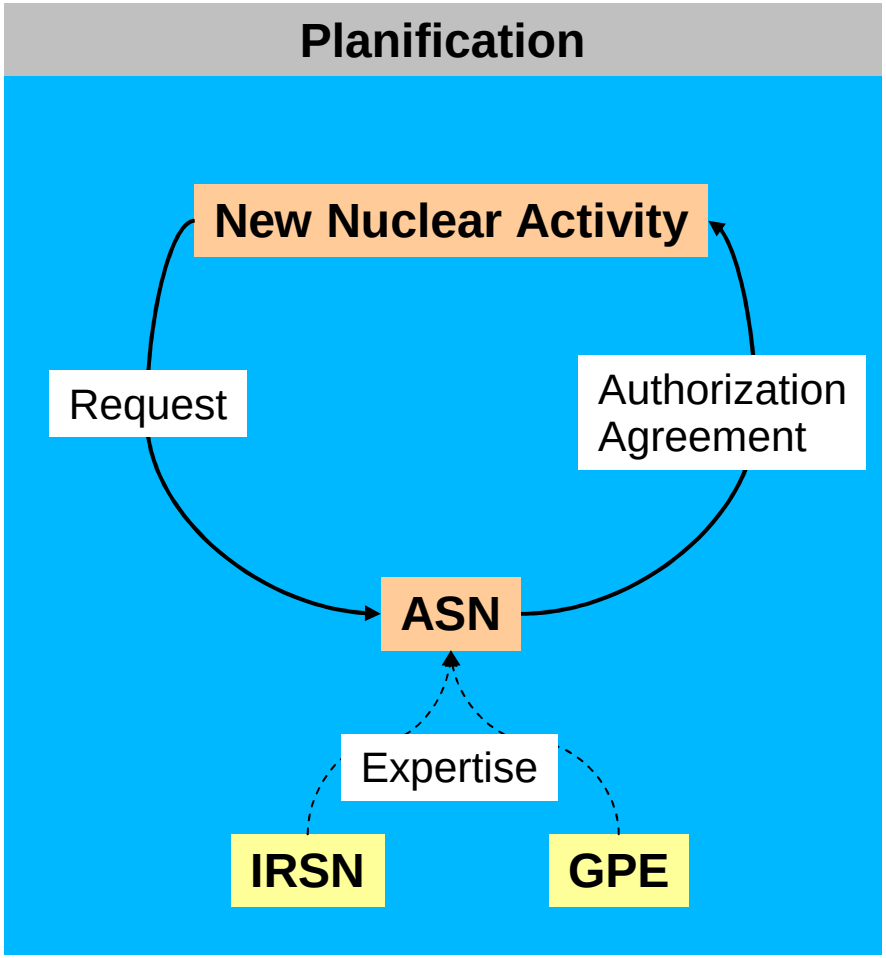
French regulatory limit values ensue from directives of the CIRP 60

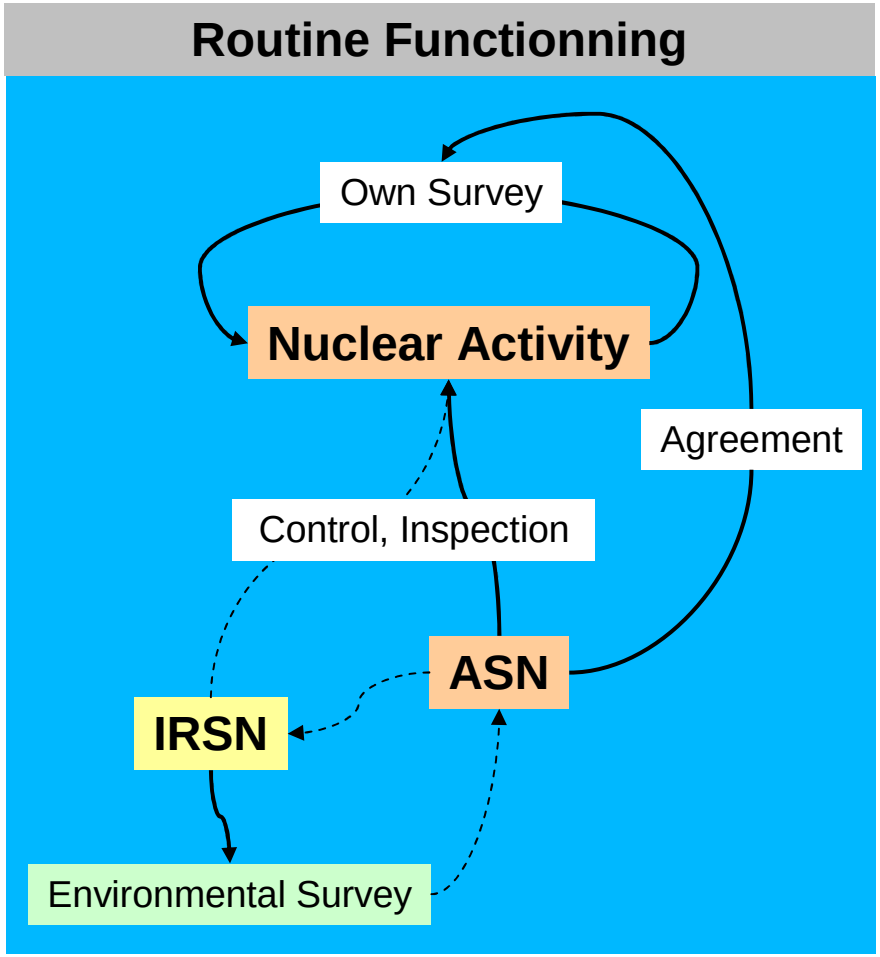
	Public	Workers
Effective dose	1 mSv during 1 year	*100 mSv/5 consecutive years* *50 mSv/year*
Annual Equivalent Dose Eyes Skin Hands, Foots	 15 mSv 50 mSv -	 150 mSv 500 mSv 500 mSv

Regulatory framework



Regulatory framework





Modelling approaches (routine fonctionning)

- **Modelling is mainly used by :**

1. Nuclear operators to prepare the requests submitted to ASN. To demonstrate that the proposed procedures allow to respect the regulatories limitations.

2. Experts to analyse these submissions.

• No obligations for specifics models. Each actor can choose his own approach with the exception of the calculations of doses.

• Preference for site specific approaches (meteo, land use, diet…).

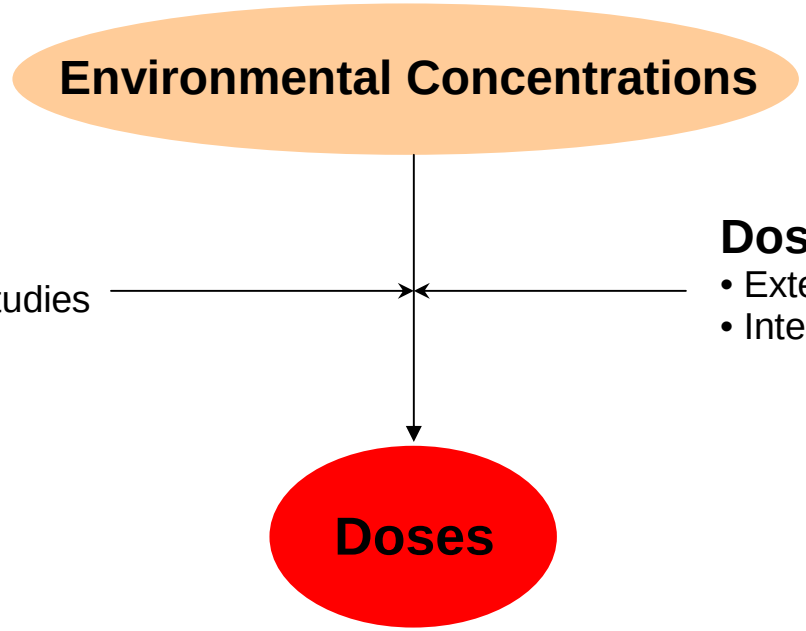
IRSN Modelling Approaches for Routine

Release
- **Permanent**

Atmospheric Dispersion
(FOCON)
- Gaussian panach approach
- Doury standart deviation
- wet and sec deposition

River Transfert
(AQUAREJ)
- Dilution, Kd, FT
- Permanent
- Equilibrium

Marine Transfert
(CREMER)
- Dilution factors, Kd, FT
- Permanent
- Equilibrium



Human Exposure
Reference groups →Local studies
Age classes (ICRP)

Dose Factors
- External (Eckerman & Ryman, 1993)
- Internal (ICRP 72)

Some orientations for the futur

- New ICRP Directives.
- Low doses effects
- Environmental doses.
- Take into account non permanent and non homogeneous situations.
- Integrated modelling approaches.

SYMBIOSE
(IRSN – EDF)