



IRPA

Initiative on RP culture

International Radiation Protection Association



**World Health
Organization**

**Improving Radiation Protection Culture
An IRPA Working Group proposed by SFRP**

**FS, OvS, SFRP meeting
Strasbourg 19-20 May**





RP culture initiative

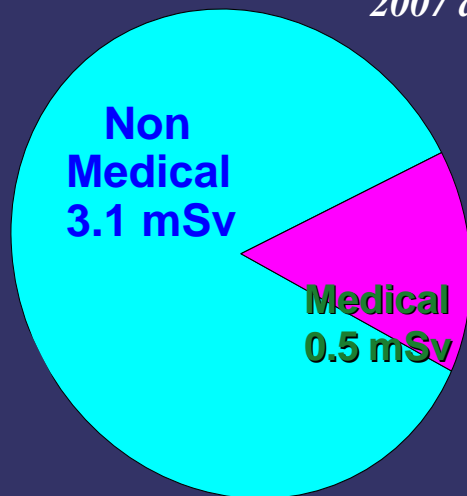
- **We are observing significant development in the use of ionising radiation in the medical field as well as nuclear industry revival throughout the world,**
- **The generation who developed RP applied today is gradually leaving now and in the next ten years. As we change the core of the teams, we must remain vigilant in order to maintain a high degree of competence and to continue making progress in radiation protection**
- **The use of radiation sources in new sectors, companies or countries may lead to some loss of this RP heritage.**



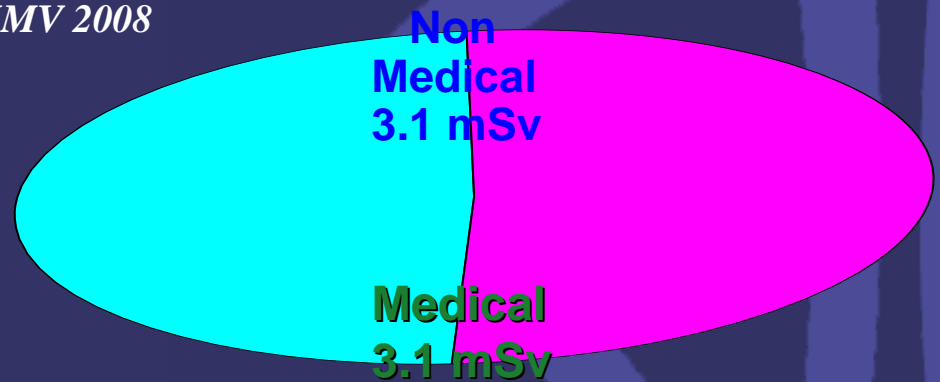
Mean individual total radiation dose in the US: 1980 vs. 2007

1990 data : NCRP Report 93

*2007 data: Mettler et al. 2008,
IMV 2008*



1980: 3.6 mSv

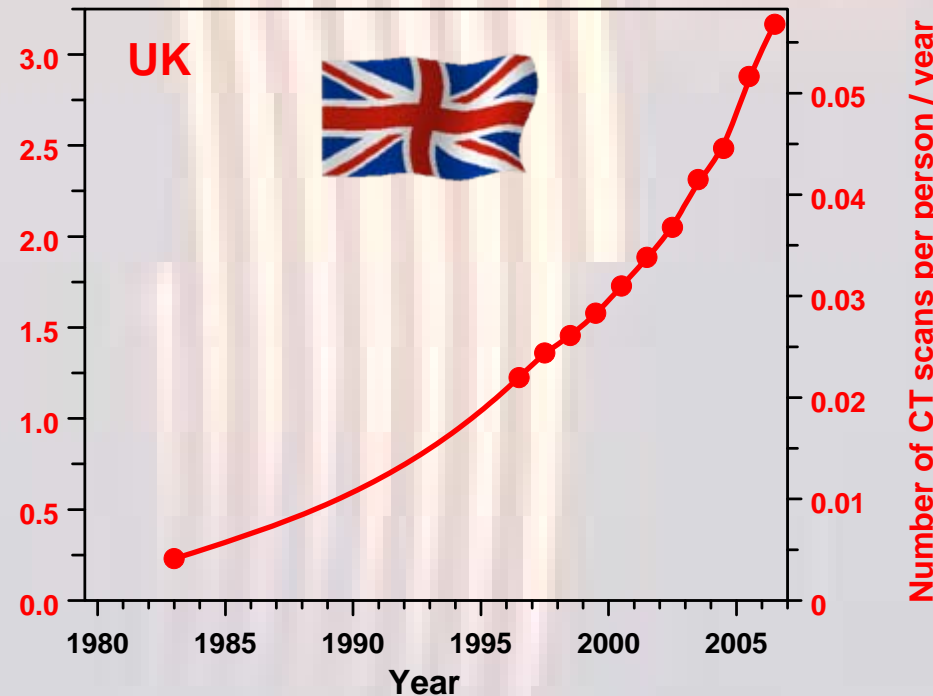
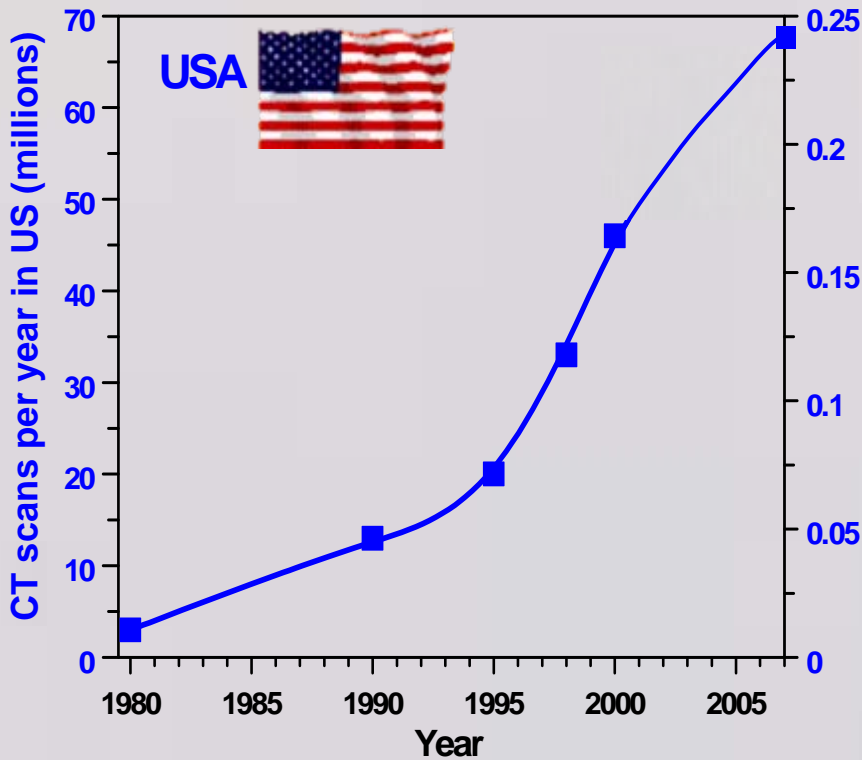


2007: 6.3 mSv

The use of radiation in health care is by far the largest contributor to the exposure of the general population from artificial sources

Why are we particularly interested in CT?

Frequency of CT scans per year



Radiation in Health Care

- As the benefits for patients gain recognition, the use of radiation in the diagnosis and treatment of human diseases increases.
- While the development of modern health technology makes new applications safer, their inappropriate use can lead to unnecessary or unintended radiation doses, and can imply potential health hazards for patients and staff.





Current situation in medical exposure

Justification

- **Instruments exist:**
 - **International and national legal level: Basic Safety Standards, directives, national regulations...**
 - **BUT NOT DELIVERING EXPECTED REDUCTION**
 - **International and national professional level: advice by expert groups eg appropriateness criteria for case-by-case justification – protocols**
 - **BUT NOT USED BY PRACTITIONERS**



Key actors and stake holders

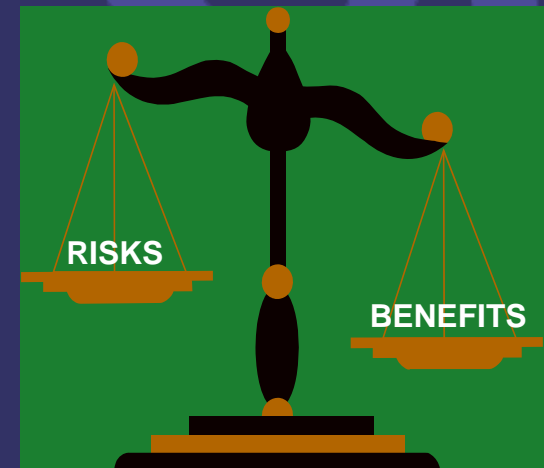
Key decision points

- Patient
 - Referring practitioner
 - Radiologist
 - Radiographer
 - Other health professionals
 - Rad. regulatory authority
 - Health authority
 - Professional bodies
 - Scientific bodies
 - Other int'l orgs
 - Industry (designer, vendor)
 - Educators
 - Public at large
- A **systemic** problem
 - Multifaceted, complex
 - Involving many actors, actions, interfaces
 - Many levels and mechanisms...
transdisciplinary approach essential
 - Look at drivers of situation



Challenges

Although individual risks associated with diagnostic exposures are rather low, the wide use of radiation in medicine calls for a **public health** approach to control and minimize health **risks**, while maximizing the **benefits**





Challenges

- Needs for a global approach included public perception
 - **Understanding , believes attitudes and perception (Concept for understanding)**
 - ex: comparison deals with fire.
 - **perception has changed: Zero risk, LNT....**
- **Idea on priorities : step by step approach in different group :professionnal, public, patients ...**

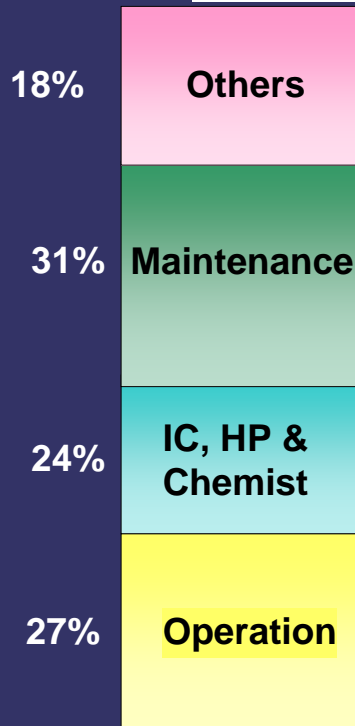


Nuclear in France

• EDF is the World's leading Nuclear Operator

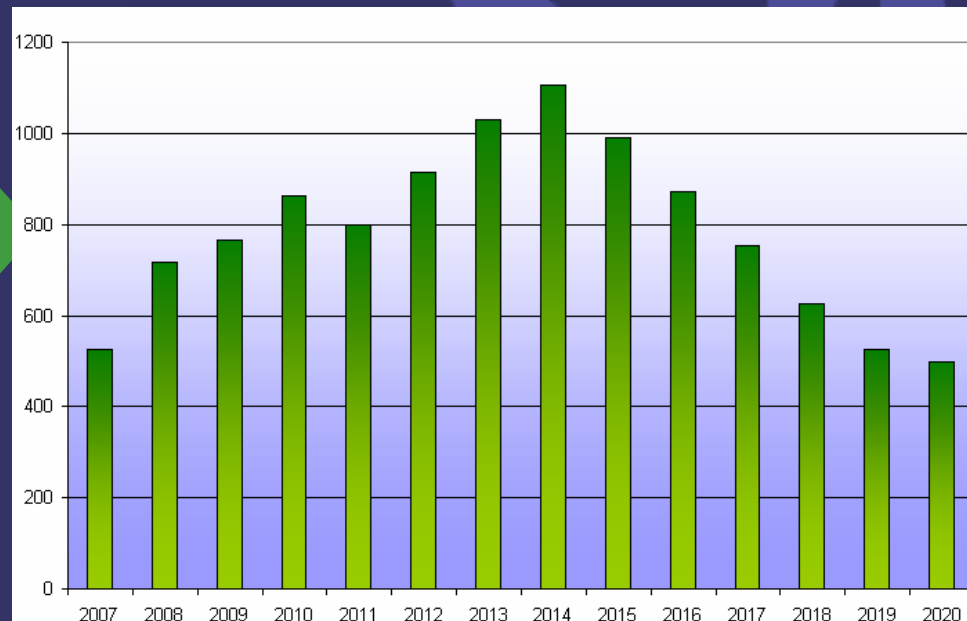
with

- 63 GW of capacity (88 % of the French generation), spread in 19 Nuclear Power Plants, produced by 58 reactors
- EDF NPP 2008 Internal workforce : 19000 employes, 40% are being replaced in the next 8 years



“Talent Nursery”
1000 people

Retirements





Issues

- **Greying baby-boomers, or the « papy boom » effect**
 - The NPP pioneers are leaving : How to conserve their knowledge and experience ?
- **Meeting the EDF Group's restructuring expectation**
 - How to meet nuclear expectations as well ?
 - How to reassure the managers ?
- **Hiring young workers, increasing nuclear safety**
 - How to attract the internet generation by the 70's technology ?
 - How to train and permit mistakes on an operating plant ?
 - How to create fundamental nuclear attitude in a safe and ordinary environment (without TMI, Tchernobyl etc...) ?



What are our major challenges ?

- One way of preventing the risk is to root radiation protection in the general culture and so to develop a RP culture.



Why should radiation protection be rooted in culture?

- **What is the point of achieving results if they are not sustainable!**
- **Because our common radiation protection value has always been to share our know-how and optimisation initiatives for continuous improvement of our practices.**
 - **Shared attitudes and actions of openness and transparency, with roles and responsibilities clearly defined for each individual:**
 - **Shared responsibility between practitioners and their line management, but never any dilution of responsibility,**
- **Multi-disciplinary backgrounds, different types of awareness and training.**



BSS 2.0: no difference between safety culture and RP culture

2.47. The principal parties shall foster and maintain a safety culture by:

(a) Promoting individual and collective commitment to protection and safety at all levels of the organization;

(b) Ensuring a common understanding of the key aspects of safety culture within the organization;

(c) Providing the means by which the organization supports individuals and teams in carrying out their tasks safely and successfully, taking into account the interaction between individuals, technology and the organization;

(d) Encouraging the participation of workers and their representatives and other relevant persons in the development and implementation of policies, rules and procedures dealing with protection and safety;

Encouraging open communication within the organization and with other relevant parties, as appropriate;

(g) Encouraging a questioning and learning attitude and discouraging complacency with regard to protection and safety;

(h) Providing the means by which the organization continually seeks to develop and improve its safety culture.



Safety and RP Culture

- **Industry**
 - One and the same process for safety culture and RP culture within the nuclear industry (C.A. Lacoste IRPA12), but differences in the one should not be incompatible with the other.
- **Hospital**
 - There are many points in common with safety culture, but unlike safety culture, which only concerns the nuclear industry, these points must be developed in all sectors using ionizing radiation, including the medical and industrial communities.
- The concept of operational safety was initially developed for application within an industrial context (facilities, installations), i.e. starting as a country-specific approach (the State's prerogative), followed by an international approach on the other hand,
- operational RP based on international RP level, European directive, governed by hard law, to be subsequently adapted to national level for implementation.

- Principle : Two axes of work:

1. What a culture RP?

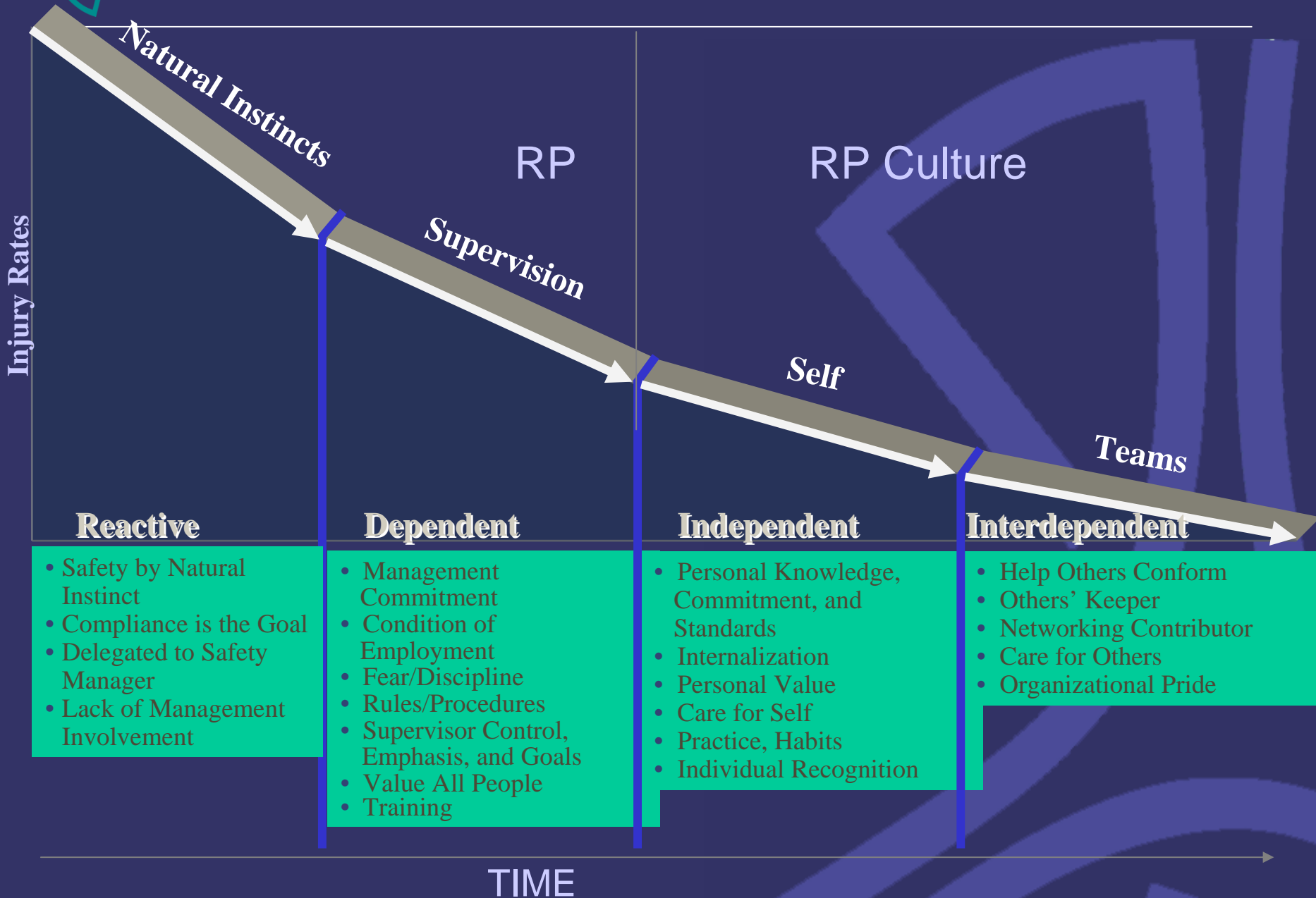
- *In analogy to a definition of safety culture: Safety culture is a term often used to describe the way in which safety is managed in the workplace, and often reflects "the attitudes, beliefs, perceptions and values that employees share in relation to safety" (Cox and Cox, 1991).*
- A proposal: The term "RP culture" means the way in which RP is founded, regulated, managed, performed, preserved, and perceived in the workplace, in medicine, and every day's life and reflects "the attitudes, beliefs, perceptions, goals, and values that all parties involved share in relation to RP".

2. How can we develop it?

Culture must be more than rules; it must be lived because of knowledge and understanding

- *RP principles*
- *Fields of RP*
- *RP players*
- *RP practices*







What are our RP Culture values ?

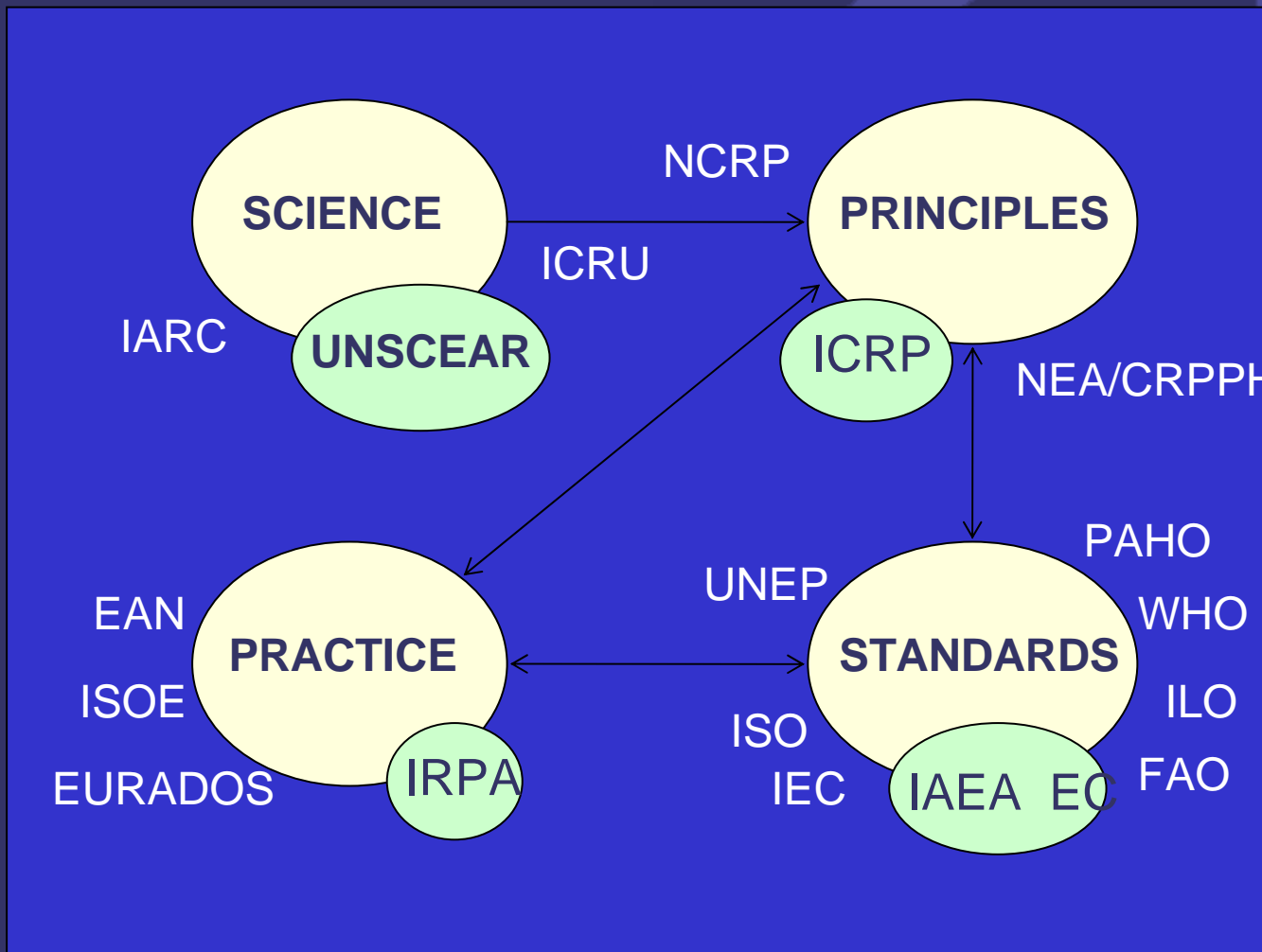
- This RP culture values should be based on:
 - Justification/ limitation/optimisation with mutually sustaining principles: fairness (reducing dose levels of the most exposed individuals) / equality of treatment for in-house/outside workers
 - **A common culture included a common ethic, which must be based on basic scientific evidences and an approach based on the political, social, economical approaches**
 - No “harmlessness threshold”: importance of continuous improvement,
 - Awareness of risk, whether in the industrial or medical sectors
 - Willingness to share among professionals, no notion of ownership, information must be shared, e.g. each society has its journal to promote the acquisition and sharing of knowledge, organizes congresses (experience feedback)
 - Multi-disciplinary backgrounds : varied training rather than homogenous systems; no “hard and fast” systems



This RP culture should be based on:

1- Basic scientific evidences

The 4 pillars of the international organisation of radiation protection (J Lochard)





This RP culture should be based on:

1. **Competencies** founded on a strong set of working knowledge.
 - ICRP a important part of the culture as recommendation based on scientific knowledge but the total culture is much more, There is a need to share our approach
2. **“Reflex” attitude** based on education and transparency.
3. **Top down approach to regulate the process with Clear responsibilities assigned to all actors** : from regulators (independent from the operator) to workers
 - needs of strong regulators, External assessment: not being one’s own judge; fresh, critical appraisal of what we do (inspections, audits, benchmarking)
 - planning and own control, national control and international harmonisation , basic requirements.
4. **Engagement of the stakeholder** for the establishment of the regulation on behalf of the society

RP: a mix of Scientific evidences and concept of protection



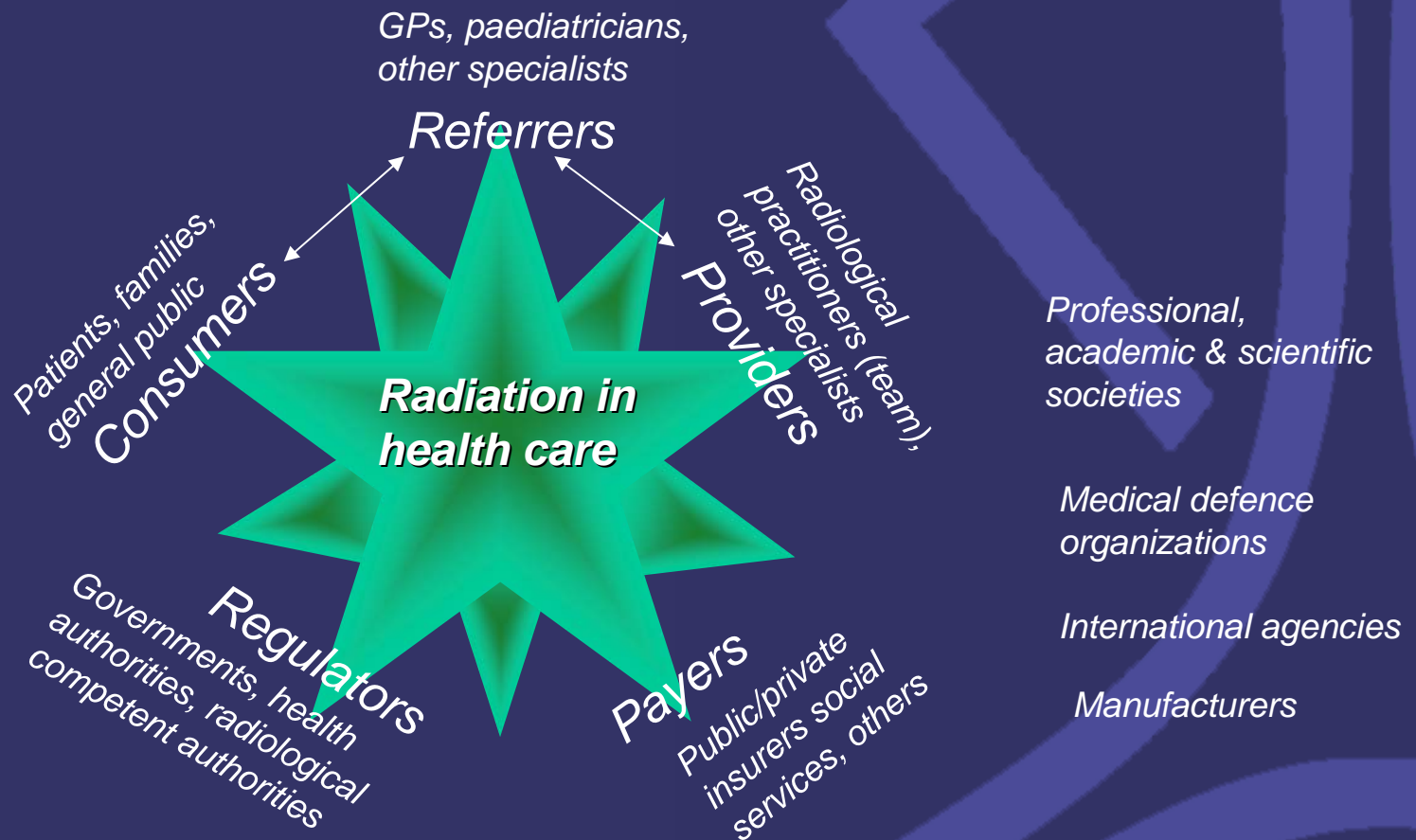
Example – CT scan- Pressures on responsible actors in medicine...

- **Problem deeply entrenched - Lots of pressure on the professionals over the past 20 years – putting blame on them, but pressure coming from outside –**
 - **Patient demand:– The patient expects an instantaneous response**
 - **Government also expects such practice in setting targets**
 - **You can sit an hour with patient discussing headache and not have answer as to aetiology – but if you prescribe a CT scan you can eliminate « tumor » in a minute!**
- **Should radiologist take the precious time to re-do the justification**
- **How can we involve the medical world in the RP process?**
 - **Delicate task of challenging colleague's prescription...**



Stakeholder engagement

To foster positive relationships and encourage stakeholder involvement as partners as well as target users of the tools (M. Perez –WHO)





How to position the RP risk within an integrated risk management system ?

- **It's a global approach , it's a safety culture including all the risks on IR. We need to avoid to dilute the risk assessment.**
- **Difficulties to have a total knowledge on everything: Need of specific program , specialist , expertise , institute To have a multi-disciplinary approach**
- **Important to take into account the risk at a good level and to encourage link, cooperation between relevant actors, players each specialist of a certain risk, all together in order to have a global risk approach.**



How can RP culture be fostered?

- **By sharing our cultural values and our ways of handing them down to news generations, :**
 - **Role of Professional associations as IRPA which discuss and promote such a culture.**
 - Professional congresses, tutorial sessions
 - Promoting professional networks (WHO, EAN,)
 - Scientific/doctrinal/regulatory reference base
 - **Reference documents: The state of science (UNSCEAR), Management principle, recommendations (ICRP), directive on basic standards and/or Basic safety standards, and finally, transposition into national law and into local regulations within industrial facilities, companies, etc.**
 - Basic tools to be used for acquiring knowledge (guidelines, implementation procedures, e-tools, etc.) and promoting appropriate attitudes: equivalent of INSAG 13 (?), but enforced by our community of RP professionals, grouped together within the IRPA.
- **Professional associations that share information and promote this culture**
- **All these challenges shall be raised in the next future and will require the worldwide RP community commitment**



What could be the schedule?

- Define a guideline on RP culture based on the successful experience of the IRPA WG on guiding principle on stakeholder engagement
- 2 axis :
 - What is a RP culture?
 - How could we help to develop this culture through the world?

