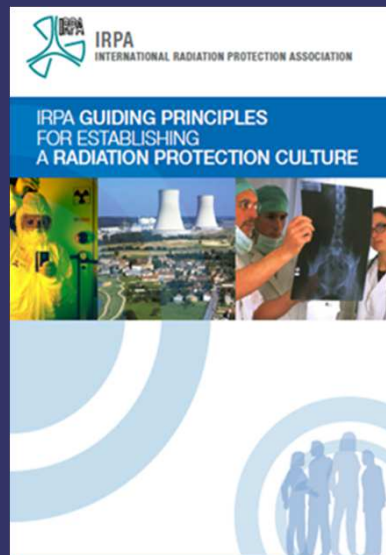




Radiation Protection and Emergency Management Aspects

Culture drawn up by RP professionals



Dr B Le Guen MD, PhD
IRPA Executive Officer

**NEA/CNRA/CSNI/CRPPH Joint Workshop on
Challenges and Enhancements to Safety Culture of the Regulatory Body**
Paris , France, 3rd June 2015



What is meant by Culture?



- The ideas, beliefs and customs that are shared and accepted by people in a society.
- That complex whole, which includes knowledge, belief, art, morals, law, customs, values, symbols, rituals and any other capabilities and habits, acquired by people as members of society that determine appropriate attitudes and behavior



Culture :a combination of habits and knowledge



- (1) Beliefs, values, and assumptions of the **founders** of an organization,
- (2) Learning **experiences** of group members as the organization evolves (Groups of people who have shared significant problems, solved them, observed the effects of their solutions, and who have taken in new members)
- (3) Beliefs, values, and assumptions brought in by **new members** and leaders.



Why an interest for a Radiation Protection Culture?

- To give visibility to the fundamentals of RP
- To promote radiation risk awareness (conscience)
- To promote shared responsibility among practitioners, operators, manufacturers, management and regulators
- To maintain the RP heritage
- To facilitate its transmission
- To improve continuously the quality and effectiveness of RP
- To contribute to the general safety



Safety Culture vs RP Culture

Safety culture is a concept that has been defined by different institutions, organizations, and there is a common understanding of its meaning

- Safety culture includes nuclear safety, RP, occupational safety, security, health, environmental safety, patient safety ...
- Hence, RP culture in our organizations should be seen as the implementation of RP principles inside the framework of safety culture



SC definition

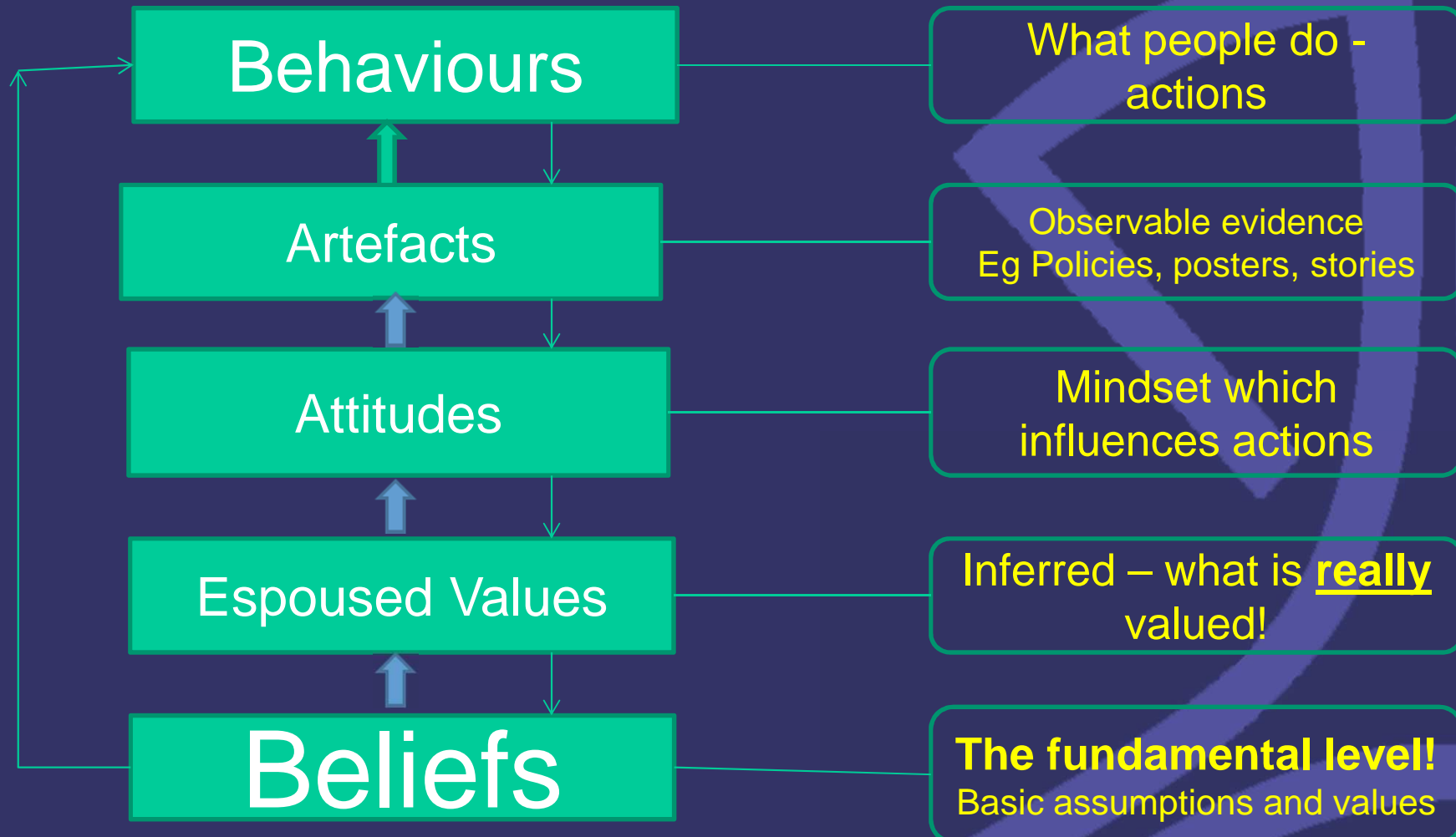
An organization's values and behaviours, modelled by its leaders and internalized by its members, which serve to make safe performance of work the overriding priority to protect the public, workers, and the environment. *EFCOG (US DoE)*

Safety culture is that assembly of characteristics and attitudes in organizations and individuals which establishes that as an overriding priority, [nuclear plant] safety issues receive the attention warranted by their significance. IAEA

“The way we do things around here when nobody is looking.”
Common sense approach!



Safety Culture (according to Schein)





RP culture development and improvement

What are the ways to impact radiation protection culture?



- **Strong leadership,**
- **Education and training,**
- Establishment of **a positive behavior at the working place** (Individual and collective behavior)
- A proper **communication** among all practitioners.
- Similarly, **learning from events,** incidents and near misses is an important part of culture development with of **a ‘blame-free’ policy to report**



Safety Culture Development

Over the past 20 years many organisations have developed models of safety culture, including definitions and structures, eg:

- **IAEA (INSAG)** – 5 Key Attributes of a (nuclear) safety culture
- **US NRC** – 9 Traits (behavioural elements) of a safety culture
- **WANO/INPO** – ‘8 Principles for a Strong Nuclear Safety Culture’, integrated into Performance Objectives and Criteria
- **ONR** – 4 Principles of Leadership and Management for Safety

In the main, these are ‘variations on a common theme’ – with different packaging and emphasis!



The zero risk doesn't exist , Process must be fault tolerant that's why

- Responsibilities must be Understood**
- Responsibilities must be Manageable**
- Early Warnings must be Available**
- Must Learn from others Mistakes**
- Corrective Actions must Occur**
- Audits must be Conducted**
- Peer Review must Happen**
- Process should be Accredited**

➤ 10 Basic Elements



➤ *Safety Culture in Regulatory Authority*

➤ *to provide a conceptual framework and guidance for the Regulatory Authority about its internal Safety Culture*



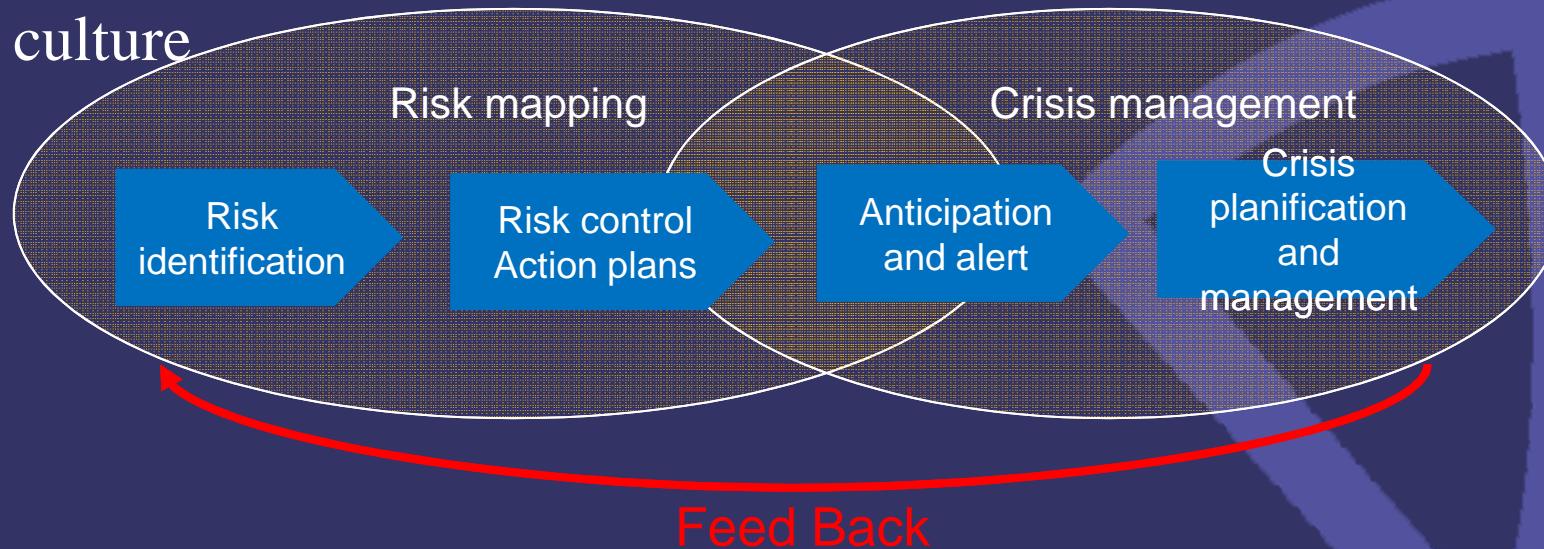
CULTURE IN CASE OF EMERGENCY



Links between Risk mapping and Crises Management :

an comprehensive approach to prevent crises

crisis culture

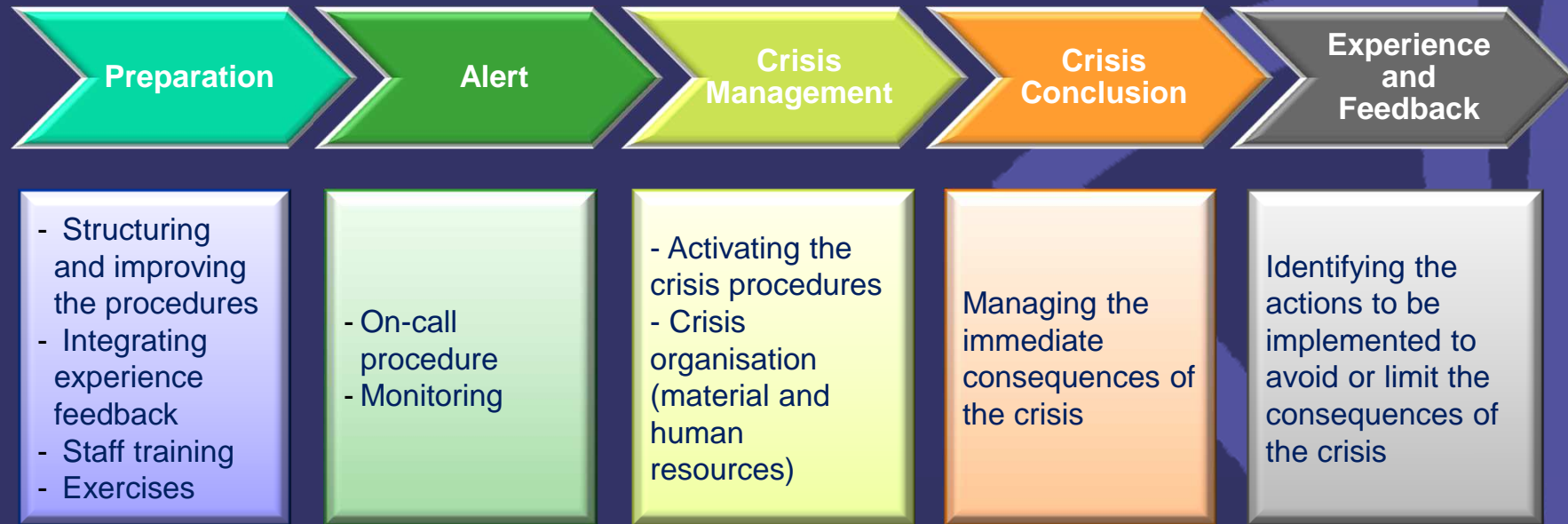


- Preparation to crisis is the last step of the risk control process
- Preparation to crisis requires to know well the risks environment
- Links between **risks culture** and **crisis culture** → a systematic feed-back approach



Crisis Policy

The basic principles: 5 phases



These principles are implemented at all levels, from the regulator level to the operator level

According to these principles, each institution concerned by the crisis management policy must: have a relevant crisis organisation and the associated material and human resources; carry out at least one crisis exercise per year on its perimeter; organise actions to increase the professionalism of the crisis managers and staff



EMERGENCY PREPAREDNESS AND RESPONSE ORGANISATION

**Practical example
of emergency
culture : Training
on Tactical method**



Tactical methods

Analysis and decision making under emergency situations, when pre-established procedures are no more relevant



- Developed by military forces, adapted by fire brigades
- Methods are described but there is no use of procedures on the field → appropriation by drill

Taking action in a destroyed environment

Analysis and decision making under emergency situations

- Ex: Clear and short communication techniques



Tactical methods

Example: “report message”

message structure

Je suis	I am	My situation
Je vois	I see	Quick description of the scene
Je prévois	I guess	Predictable evolution of the situation
Je fais	I do	Actions in progress
Je demande	I ask	Needs



EMERGENCY PREPAREDNESS AND RESPONSE ORGANISATION

**Culture : how to
manage the doses
for the
responders?**



Emergency Exposure Situation

On Site – Off site

1. Members of **special radiological emergency teams** (trained, prepared, occupationally exposed)
2. **Members of classic emergency teams** (not occupationally exposed)
3. **Workers with specific skills** (e.g. bus driver; not trained or prepared, not occupationally exposed)
4. **Workers from vital facilities or activities in the vicinity, which shall stay** (not occupationally exposed)
5. **Elected representatives** (not occupationally exp,)
6. **Members of the public who freely offer their help** (with specific skills or not; not occupationally exp.)



Requirements in order to develop an Emergency culture

- Responders Preparedness is crucial
- **Protection commensurate with the situation and entrusted operations (graded approach)**
- Objective based on ALARA = doses below the RL
- Prevailing circumstances may be unforeseen and difficult
 - **Requirement both stringent and flexible (adaptable)**
 - Intervention framed in space (**zoning**) and time (**evolution**)



Requirements in order to develop an Emergency culture

- **Identification of responders**, tasks and operations (in advance whenever possible)
- The need :
 - **Informed consent** (\pm formalized)
 - **Training, preparation** or just-in-time training (specific information)
 - Individual protective **equipment** (if needed)
- **Dose monitoring and recording**
- **Medical care** (if needed)
- **Health surveillance (as appropriate)**

SPECIFIC TRAIT: PSYCHOLOGICAL AND SOCIAL MANAGEMENT OF EMERGENCY TEAM MEMBERS

STRESS MANAGEMENT AND MEDICAL MONITORING



Example of medical monitoring for emergency situations at EDF

At the time of recruitment or change of position

Medical staff

Special medical fitness for emergency duties

Information of employee by manager and occupational doctor

edf
FARN
FORC
RAPID
NUCL

edf
EXPOSITIONS
EXCEPTIONNEL

edf
PERSONNEL
EXAMINER

During emergency preparation (ex:drills)

Fitness for duty



Mandatory awareness of risks

Support as part of prevention actions required for proper physical condition (EP team members for many years)

Active participation and contribution of medical staff in emergency drills



Crossfunctional meetings with medical staff (stress management)



Medical staff from other sites

Cross-site exchanges between medical teams during drills



Upkeep of medical files+++



During actual emergency

Support and advice for all response members



Documenting exposure data



Radiological monitoring

Initial medical consideration

Psychological support

Post exposure data and follow up





Summary

- All **responders** involved are not workers (e.g. firemen, elected representatives, citizens)
- All the workers are not previously occupation. exp.
- From a RP point of view, the distinction between responders who have been previously considered as occupationally exposed and the others is relevant
- Idem about the distinction emergency/existing exposure situation

How to develop a common safety culture for all professionals ?



2- Protection criteria (ICRP Publ.103)



Distinction between emergency response and recovery actions

	Workers	Members of the public
In an emergency	Emergency exposure situation Reference level: 100mSv/year or 500mSv/year	Emergency exposure situation Reference level: 20-100mSv/year
During recovery work	⊗	Existing exposure situation Reference level: 1-20mSv/year
During normal operation	Planned exposure situation Dose limit: 20mSv/year averaged over 5 years with a maximum of 50mSv in any one year	Planned exposure situation Dose limit: 1mSv/year

⊗ Exposures received from long-term recovery work shall be treated as a part of planned exposures for radiation workers. ? But not easy to easy adapt for workers

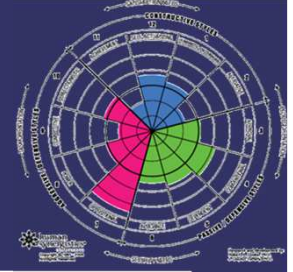


EMERGENCY PREPAREDNESS AND RESPONSE ORGANISATION

how to assess the
level of culture?



Assessment of RP culture - 1



- The assessment tools of radiation protection culture can be done in several ways,
- using a combination of quantitative and qualitative tools required to assess the level and quality of radiation protection culture,
 - not only to measure the identified criteria of success,
 - **but also to stimulate judgments and observations about positive or negative trends for such a given criteria**

Conclusion



- Developing a “field culture” in addition to the “science, engineering or medical culture” is a way to anticipate problems and to obtain the commitment of all employees and all organisations / institutions.
- Radiation protection culture is **a learned way of life**. It must be an **ongoing dialogue**
 - Among safety professionals, organizational management and the workforce
 - Between organizations , regulator , operators and relevant stakeholders