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Nuclear Safety and Security Culture in Pakistan and Nuclear Regulatory Framework in Pakistan

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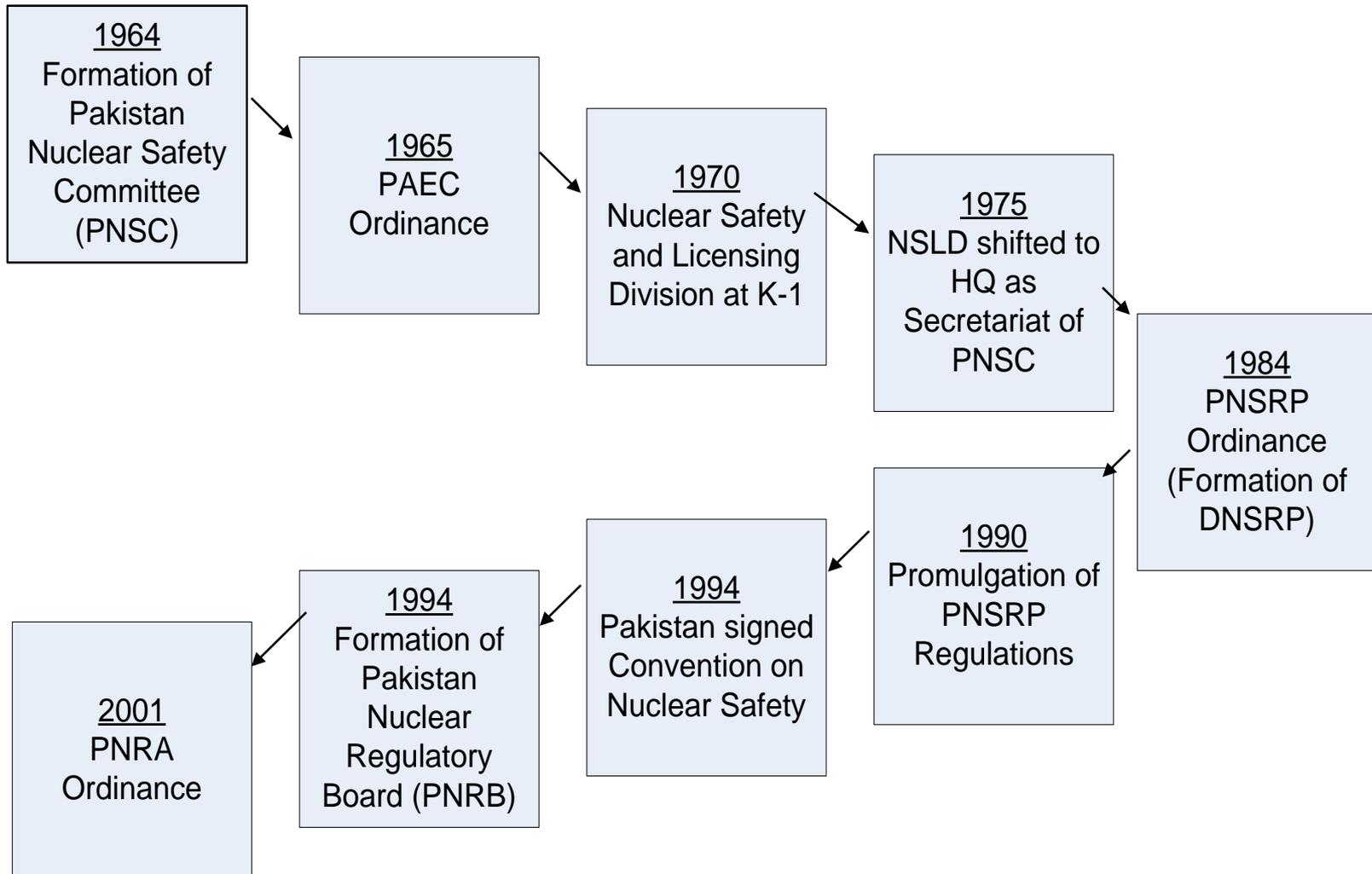# Contents

❑ Nuclear Regulatory Framework

❑ Nuclear Safety and Security Culture in Pakistan

❑ Challenges

❑ Conclusion

Nuclear Regulatory Framework

Evolution of Nuclear Safety Regime in Pakistan

1964
Formation of Pakistan Nuclear Safety Committee (PNSC)

1965
PAEC Ordinance

1970
Nuclear Safety and Licensing Division at K-1

1975
NSLD shifted to HQ as Secretariat of PNSC

1984
PNSRP Ordinance (Formation of DNSRP)

1990
Promulgation of PNSRP Regulations

1994
Pakistan signed Convention on Nuclear Safety

1994
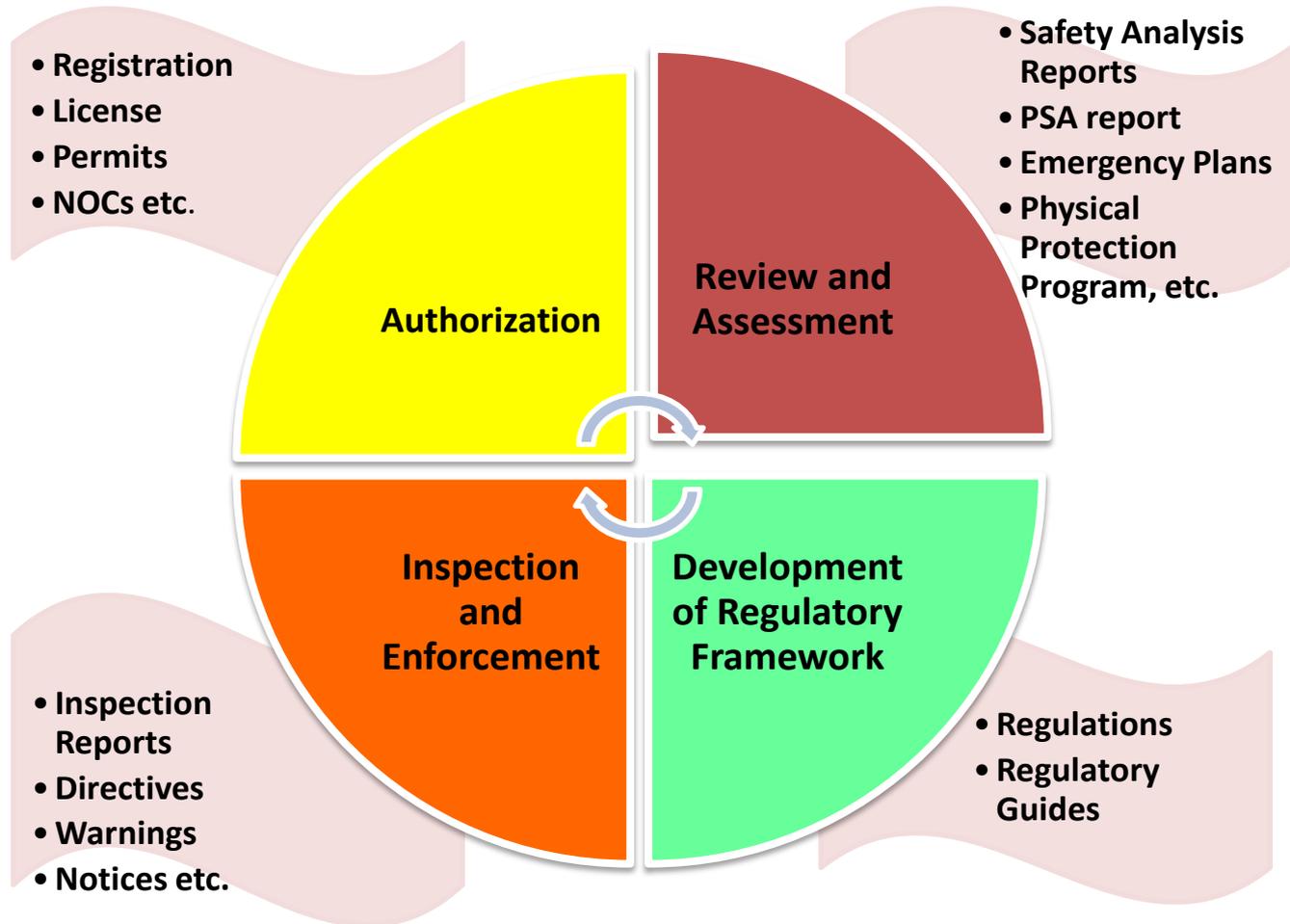Formation of Pakistan Nuclear Regulatory Board (PNRB)

2001
PNRA Ordinance

Establishment of PNRA

❑ January 21, 2001 – PNRA Ordinance

❑ Government of Pakistan Established the Pakistan Nuclear Regulatory Authority (PNRA) as an independent regulatory authority to regulate the nuclear safety and radiation protection in the country and extent of civil liability for nuclear damage resulting from nuclear incident.

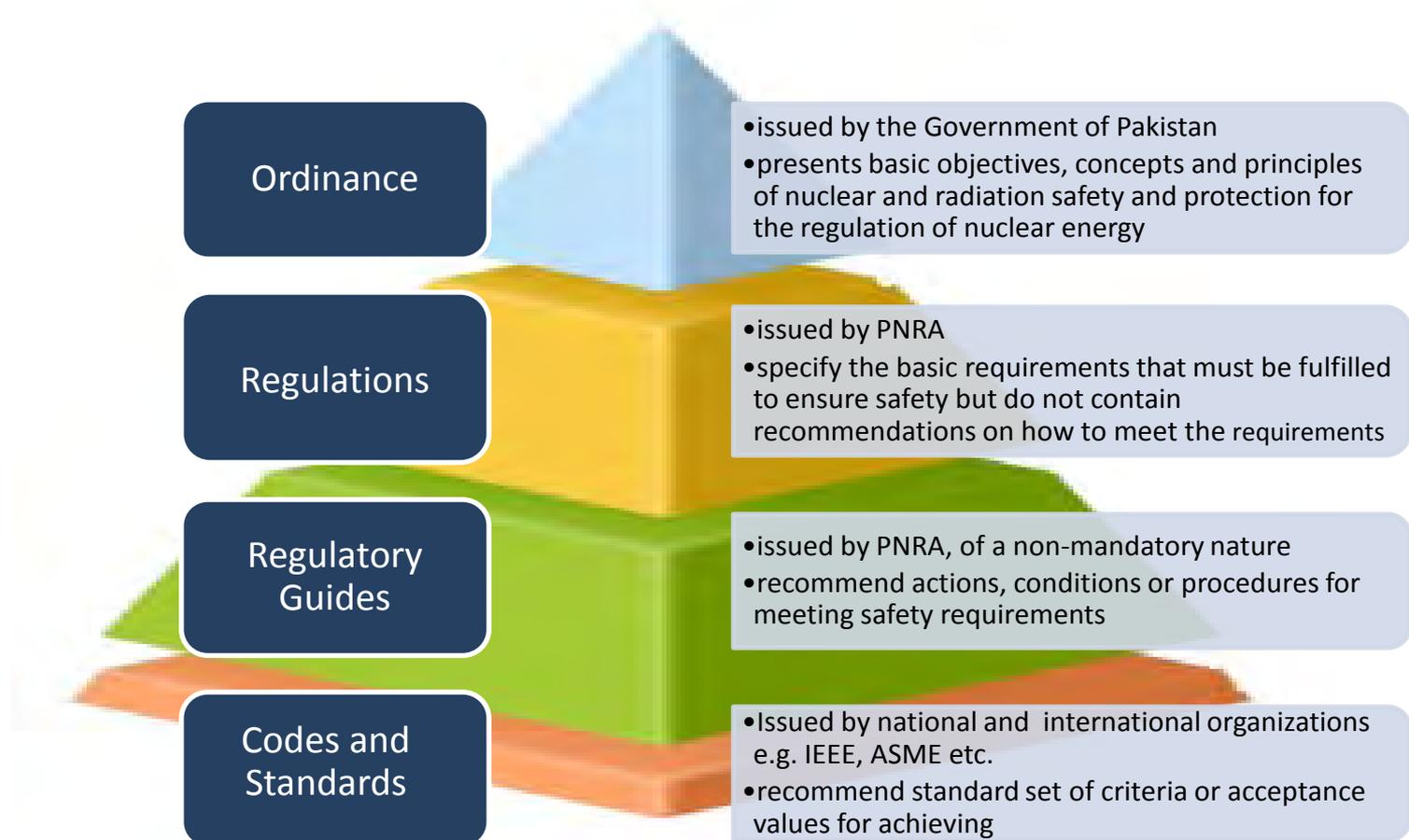# Main Functions of PNRA [Cond..]

- **Registration**
- **License**
- **Permits**
- **NOCs etc.**

- **Safety Analysis Reports**
- **PSA report**
- **Emergency Plans**
- **Physical Protection Program, etc.**

Authorization

Review and Assessment

Inspection and Enforcement

Development of Regulatory Framework

- **Inspection Reports**
- **Directives**
- **Warnings**
- **Notices etc.**

- **Regulations**
- **Regulatory Guides**

Nuclear Regulatory Framework

Ordinance
- issued by the Government of Pakistan
- presents basic objectives, concepts and principles of nuclear and radiation safety and protection for the regulation of nuclear energy

Regulations
- issued by PNRA
- specify the basic requirements that must be fulfilled to ensure safety but do not contain recommendations on how to meet the requirements

Regulatory Guides
- issued by PNRA, of a non-mandatory nature
- recommend actions, conditions or procedures for meeting safety requirements

Codes and Standards
- Issued by national and international organizations e.g. IEEE, ASME etc.
- recommend standard set of criteria or acceptance values for achieving

Nuclear Safety and Security Culture in Pakistan

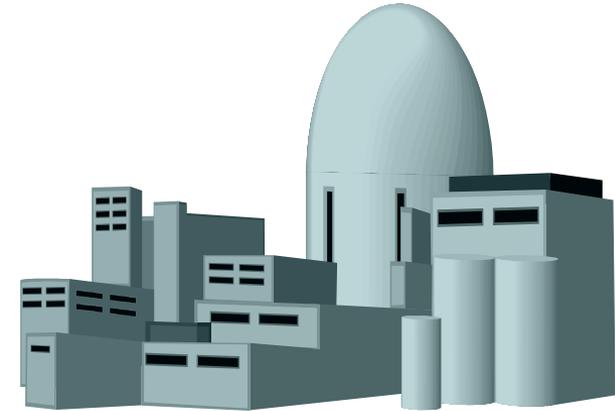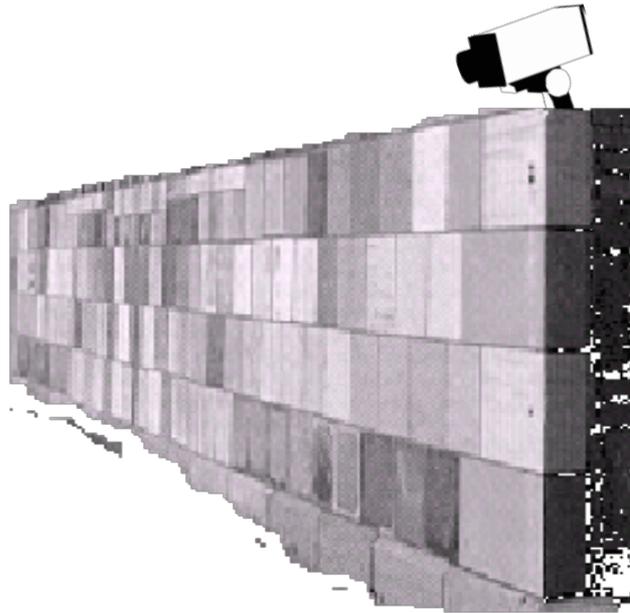# Nuclear Safety

Shielding

Time

Distance
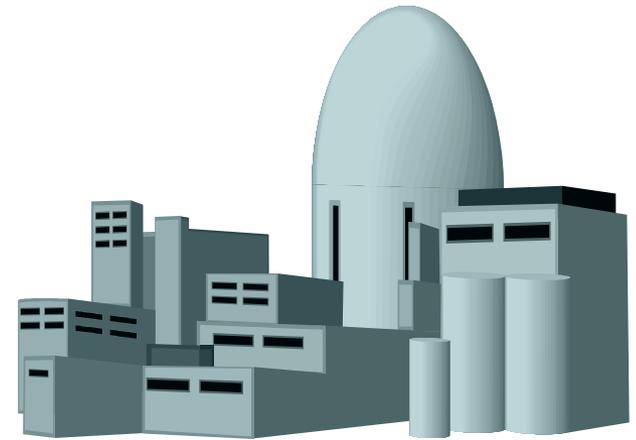
To protect man from the harmful effects of radiation

Nuclear Security

Detection

Barrier/Delay

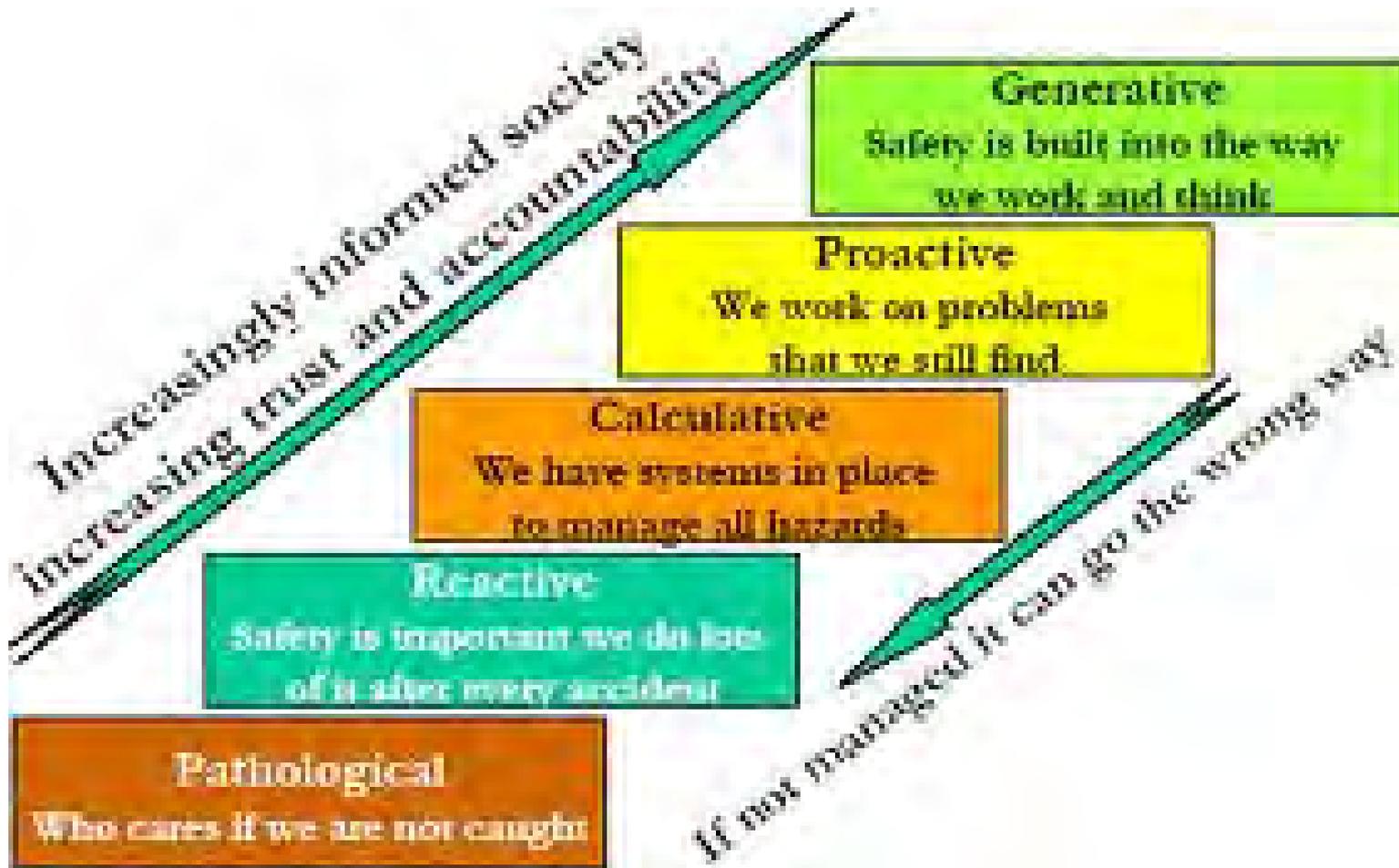**Response**

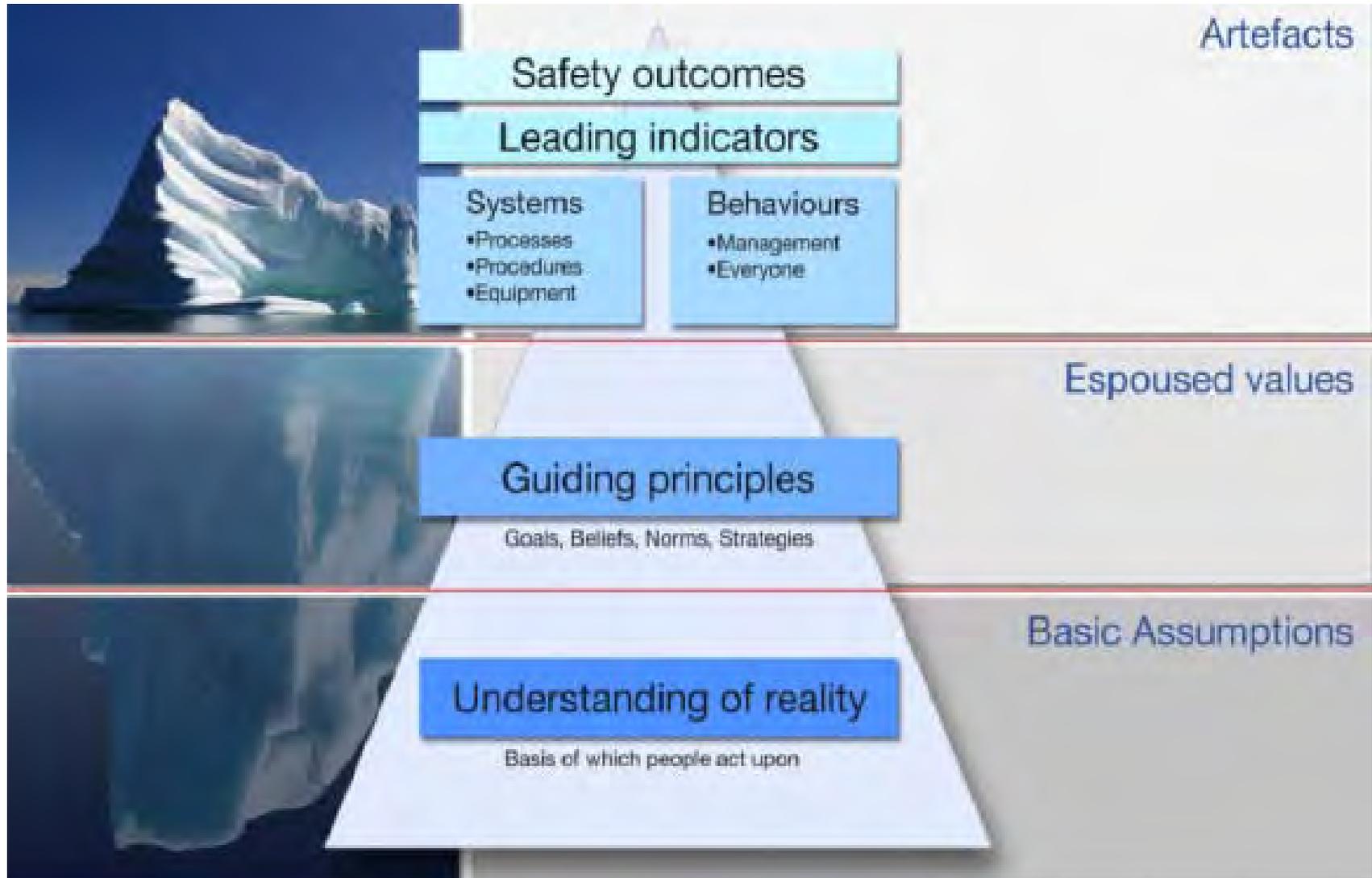To protect the facility from the harmful actions of man

Three Levels of Culture

What is Safety Culture?

❑ *"Safety Culture is that assembly of characteristics and attitudes in organizations and individuals which establishes that, as an overriding priority that safety issues receives the attention warranted by their significance". (IAEA Glossary 2007)*
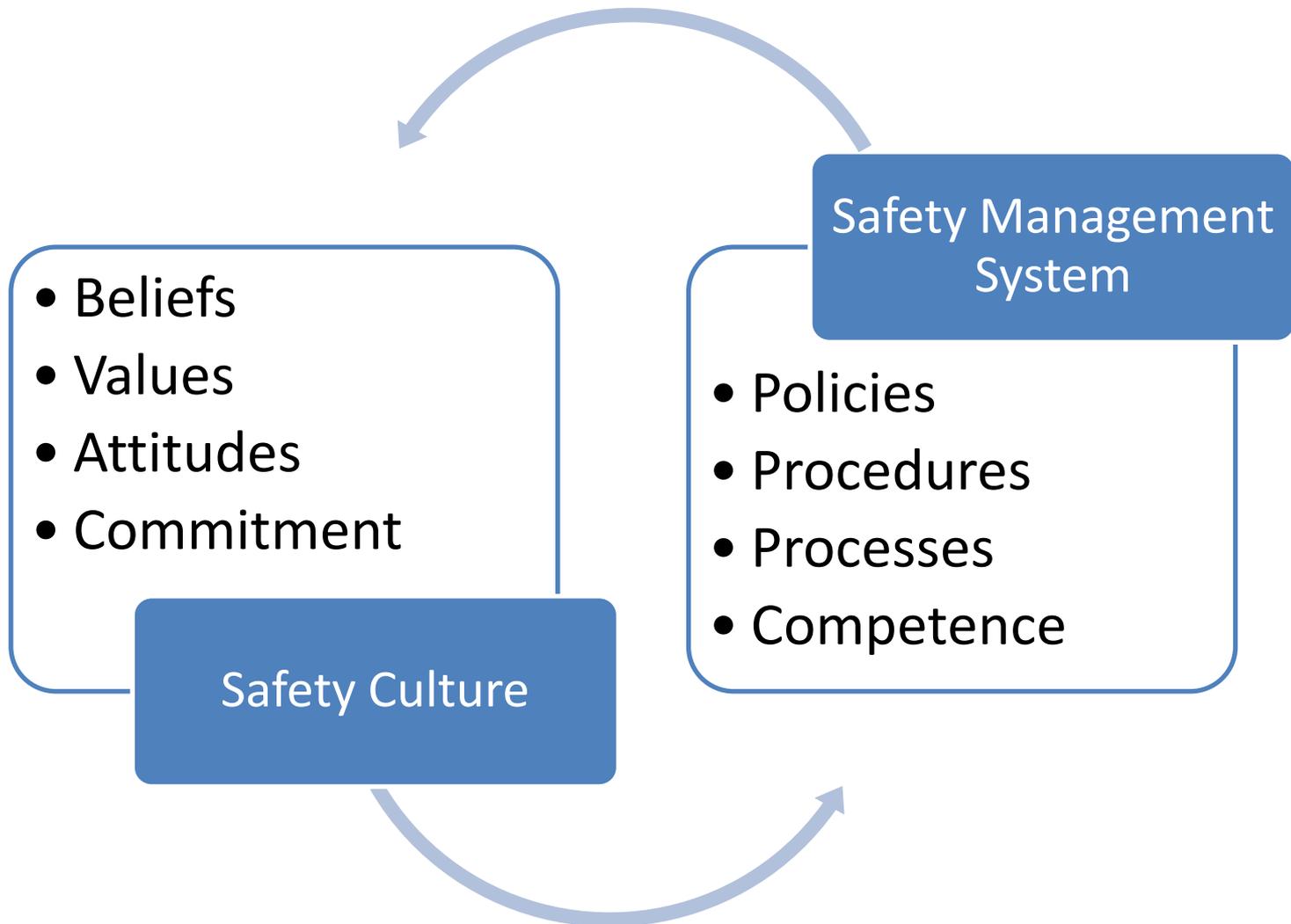
Interaction of Safety Culture and Safety Management System

Safety Culture
- Beliefs
- Values
- Attitudes
- Commitment

Safety Management System
- Policies
- Procedures
- Processes
- Competence

What is Nuclear Security Culture?

❑ "*The assembly of characteristics, attitudes and behaviour of individuals, organizations and institutions which serves as a means to support and enhance nuclear security". (IAEA Nuclear Security Series No. 7)*
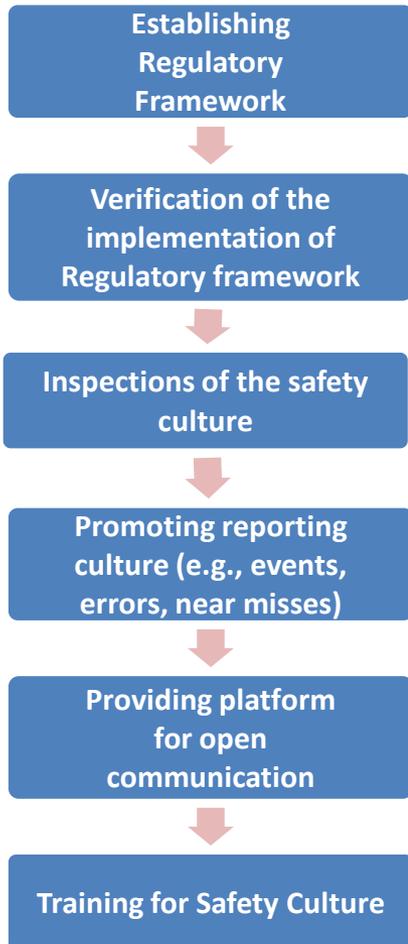
Developing Safety and Security Culture

❑ There can be three neutral elements for promoting safety and security culture within the organization (i.e. regulatory body):

✓ Overarching policy;

✓ Measures taken to implement the policy;

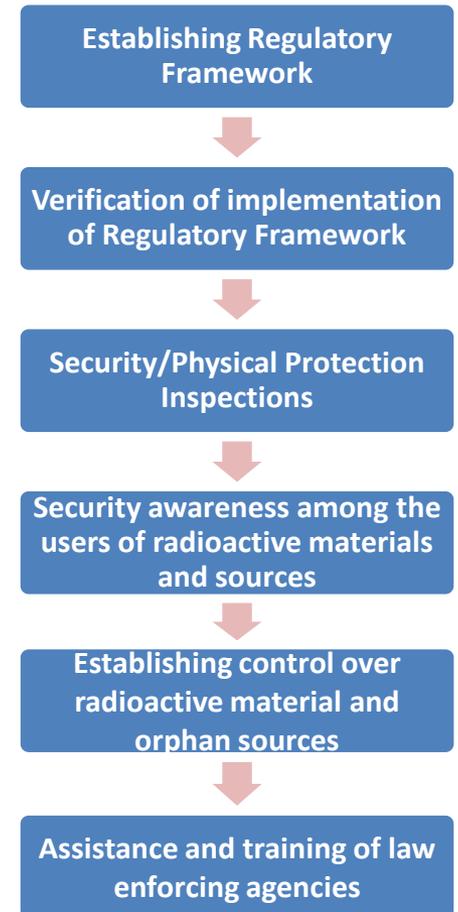✓ Attitude of the organization and individuals to implement the policy.

Role of PNRA in promoting Safety and Security Culture in Pakistan

Safety Culture

- Establishing Regulatory Framework
- Verification of the implementation of Regulatory framework
- Inspections of the safety culture
- Promoting reporting culture (e.g., events, errors, near misses)
- Providing platform for open communication
- Training for Safety Culture

Security Culture

- Establishing Regulatory Framework
- Verification of implementation of Regulatory Framework
- Security/Physical Protection Inspections
- Security awareness among the users of radioactive materials and sources
- Establishing control over radioactive material and orphan sources
- Assistance and training of law enforcing agencies

Protect the Environment

Protect the Public

Protect the Workers

❑ **Safety and Security Culture Policy of PNRA**

"Continuous safety and security improvement is our organizational goal. PNRA is committed to develop and embed a safety & security culture in all activities and decisions and recognize that it is paramount. Each individual adopts and follows the attributes to maintain and enhance safety and security in his activities and decisions to ensure protection of public and environment".

Safety Culture Within PNRA

❑ **Safety culture attributes identified by PNRA**

- ✓ Leadership Commitment
- ✓ Decision Making and Transparency in Decision
- ✓ Personal Responsibility
- ✓ Questioning Attitude
- ✓ Learning Attitude and Recognitions of Initiatives
- ✓ Effective Communications
- ✓ Respectful and Blame Free Environment

Systematic Self-assessment

❑ Performance objective and criteria has been developed which is the backbone of the self-assessment

❑ PNRA also encourages having periodic feedback from the licensee (i.e. NPPs operator) to improve its processes

Systematic Self-assessment

❑ PNRA formulated a question set which is provided to the licensee for effective evaluation of PNRA. These question set are divided into four groups

- ✓ Regulatory Framework (to check the completeness and clarity of the framework);

- ✓ Regulatory Approach (to include soft issues like communication and interface during authorization process);

- ✓ Regulatory Culture (to monitor the attitude of regulatory staff, safety culture within PNRA);

- ✓ Technical Competency (to assess the technical understanding of the regulatory staff about the regulations and application of graded approach).
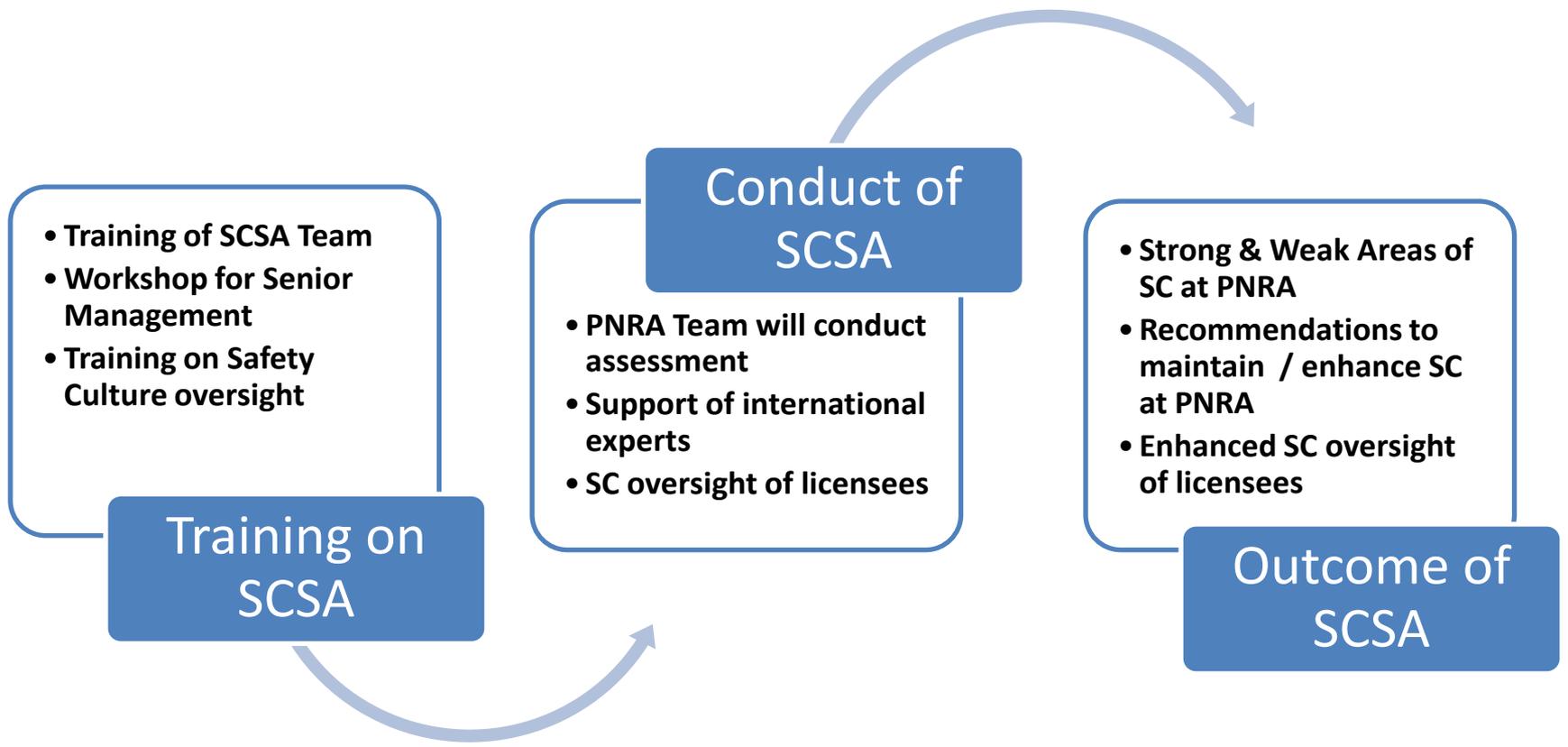
Safety Culture Within PNRA [Cont.]

Projects (Safety Culture Self Assessment SCSA)

❑ PNRA has initiated a project in cooperation with IAEA to acquire expert support and guidance on how to continuously improve the regulatory body safety culture and its re-assessment.

❑ To assess safety culture as part of regulatory oversight of regulated facilities, train the trainer program will be implemented as a part of project to train PNRA inspectors with the help of PNRA School for Nuclear and Radiation Safety (SNRS).

Training on SCSA

- Training of SCSA Team
- Workshop for Senior Management
- Training on Safety Culture oversight

Conduct of SCSA

- PNRA Team will conduct assessment
- Support of international experts
- SC oversight of licensees

Outcome of SCSA

- Strong & Weak Areas of SC at PNRA
- Recommendations to maintain / enhance SC at PNRA
- Enhanced SC oversight of licensees

Interaction of Safety Culture team with Organizational Hierarchy
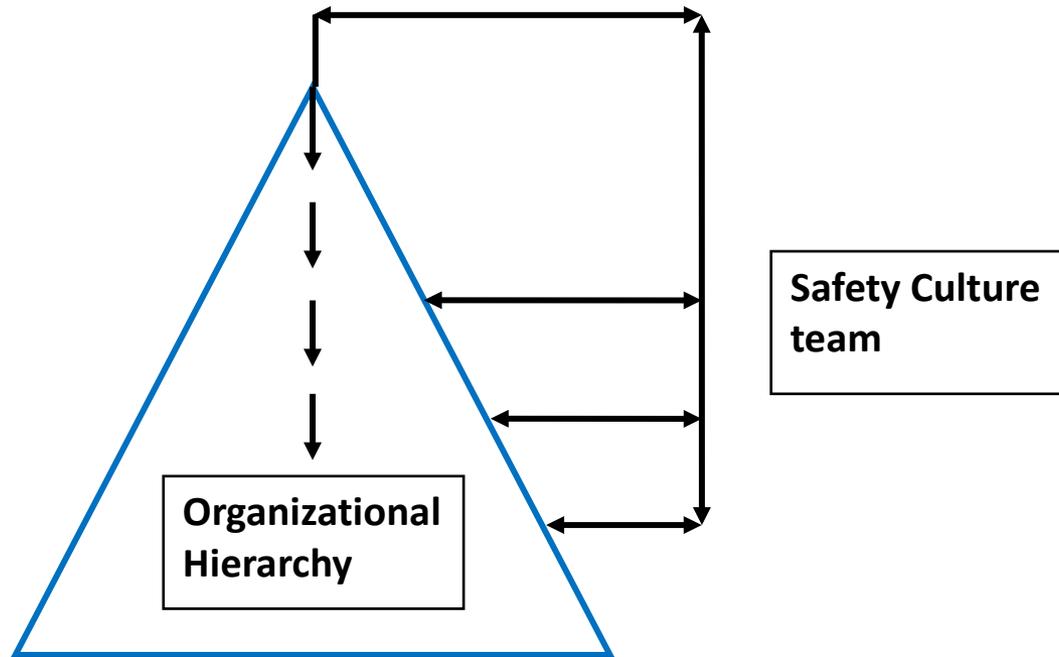
Security Culture Within PNRA

❑ Nuclear Security Action Plan (NSAP)

❑ Nuclear Security Training Center (NSTC)

❑ Radiation detection equipment to control illicit trafficking of nuclear/radioactive material at different entry/exit points of the country

❑ Nuclear Security Coordination Center

❑ management system includes clear roles & responsibilities, information & documentation control, training & qualification and Information Technology (IT) policy (including cyber security)

Safety and Security Culture within PNRA

Following steps and activities have helped PNRA in promoting a culture of safety and security:

❑ Establishment of regulatory framework;

❑ Conducting self-assessment and implementing corrective actions;

❑ Maintaining and implementing training programs for regulatory staff;

❑ Verification of the implementation of Regulatory framework;

❑ Inspections of licensee's safety culture;

❑ Promoting reporting culture in licensees (e.g., events, errors, near misses);

❑ Providing platform for open communication;

❑ Security awareness among the users of radioactive materials and sources;

Challenges

- ❑ A sustainable system for education, training & awareness;

- ❑ Media management during public awareness campaigns

- ❑ Effective communication of all agencies / stakeholders

- ❑ Handling lack of reporting culture

- ❑ Considering human factors for enhancement of safety and security culture

Conclusion

PNRA, being responsible for regulating all aspects of radiation and nuclear safety and security in the country, is committed to:

❑ Ensure that safety and security of nuclear and radiation facilities is maintained incessantly;

❑ Promote synergic culture of nuclear safety and security; as both complement each other to ensure public and environment safety.

Thanks