

# Radiation Protection Culture

is the behaviour of think and doing



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# CULTURE ?

**Dictionary:** Consists of activities such as the arts and philosophy, which are considered to be important for the development of civilization and of people's minds: cultivation, growing, group, etc.

→ Specifically, shown as a concept that describes the **shared corporate values** within an organization which influences the **attitudes and behaviors** of its members



# Chernobyl Accident

# SAFETY CULTURE

- A part of the overall culture of the organization and is seen as affecting the attitudes and beliefs of members in terms of **health and safety performance** (Cooper, 2000).
- Safety climate is a distinct yet related concept which can be seen as the current surface features of safety culture which are **discerned from the employees attitudes and perceptions** (Flin et al., 2000).
- Use the terms safety culture and safety climate interchangeably without clear cut

# **SAFETY CULTURE**

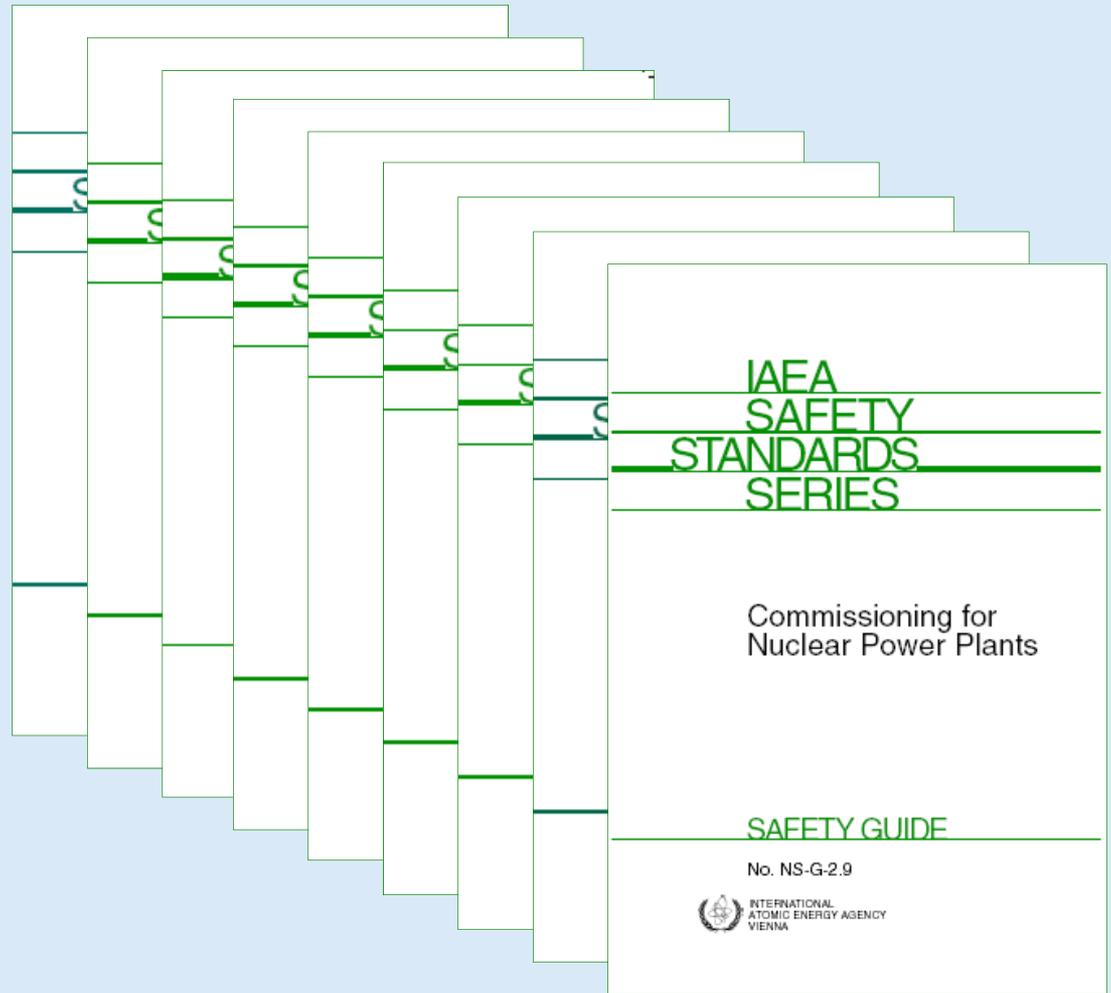
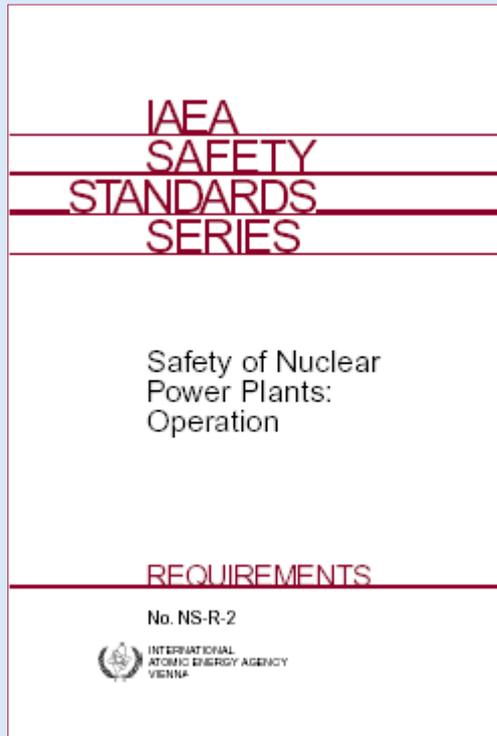
- **Management is the key influence of an organization's safety culture**
- **Attribute to safety climate:**
  - **employees' perceptions of management's attitudes and behaviors towards safety**
  - **production and issues such as planning, discipline etc → influence health and safety performance**

# Influenced Safety Behavior

- **Management's attitudes and behavior in terms of safety influence many aspects of Safety behavior including:**
  - **Success of safety initiatives**
  - **Reporting of mishaps: near-miss occurrences, incidents and accidents**
  - **Employees working safety, e.g. compliance with universal precautions, etc.**
  - **Employees taking work related risks**
  - **Influencing production pressures**
  - **Implementing safety behavior interventions**
  - **Health interventions**
  - **Effectiveness and credibility of safety officers and committees**

# **Safety Culture (IAEA)**

# IAEA Safety Standards : Operational Safety



# Related IAEA Publications

- **Developing safety culture in nuclear activities- Safety Report Series No.11, 1998**
- **Self-assessment of operational safety for NPPs- TECDOC-1125, 1999**
- **Operational safety performance indicators for NPPs- TECDOC-1141, 2000**
- **Managing change in nuclear utilities- TECDOC-1226, 2001**

# Related IAEA Publications

- **Self-assessment of safety culture in nuclear installations -TECDOC-1321, 2002**
- **Safety culture in nuclear installations- TECDOC-1329, 2002**
- **Operational safety review programmes for NPP's- Service Series No.7, 2002**
- **PROSPER Guidelines- Services Series No.10, 2003**

# Related IAEA Publications

- **Topical issues conference proceedings, 1998**
- **Topical issues conference proceedings, 2001**
- **International conference on safety culture proceedings (CD), 2002**
- **Evaluation of effectiveness of operational safety services report, 2003**

# **INSAG Related Publications**

- **Safety culture-INSAG 4, 1991**
- **Management of operational safety in NPP's- INSAG 13, 1999**
- **Key practical issues in strengthening safety culture- INSAG 15, 2002**

# Safety Culture - developments

**A need to:**

- *understand* **the concept of Safety Culture**
- **know how to assess Safety Culture**
- **know how to *improve and enhance* Safety Culture**
- **know how to *sustain and continuously improve* a strong safety culture, particularly during *times of change***

# Understanding Safety Culture

## ***INSAG-4:***

**“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”**

# **INSAG-4**

**The response of all those who strive for excellence in matters affecting nuclear safety is characterized by:**

**A Questioning Attitude**

**+**

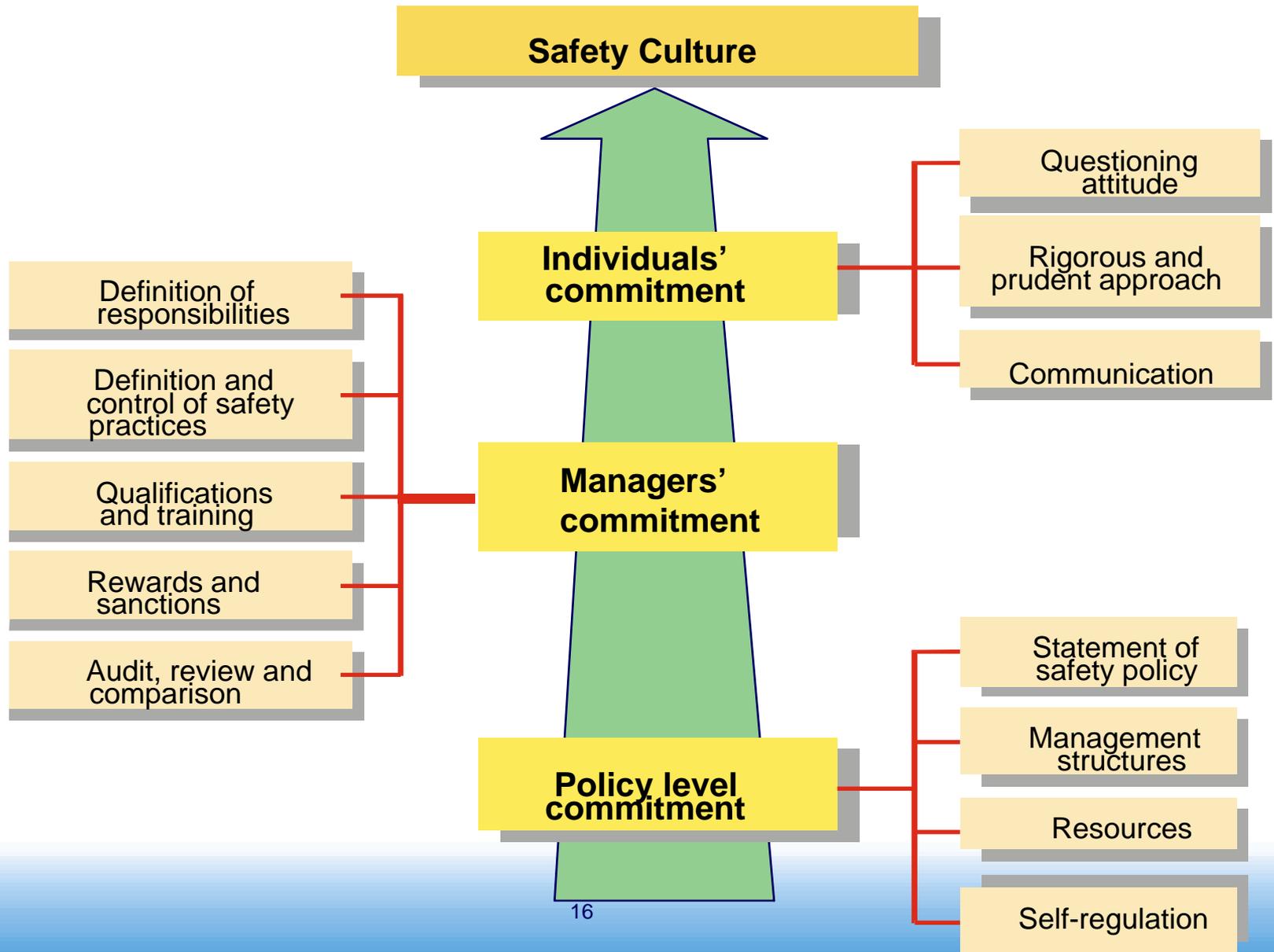
**A Rigorous and Prudent Approach**

**+**

**Communication**

**The result will be a major contribution to SAFETY**

# INSAG 4



# **INSAG-4 Safety Culture**

***Safety Culture has two general components:***

**The first is the necessary framework within an organization and is the responsibility of the management hierarchy**

**The second is the attitude of staff at all levels in responding to and benefiting from the framework**

# **INSAG-13 defines Safety Management System**

**“Those arrangements made by the organization for the management of safety**

**in order to promote a strong safety culture**

**and achieve good safety performance”**

# **SAFETY MANAGEMENT COMPONENTS**

- **Safety policy, (including standards, resources and targets)**
- **Management structures, responsibilities, accountabilities**
- **Planning (including risk assessment)**
- **Control of safety related activities**
- **Ensuring competence**
- **Communication and team support**

# **SAFETY MANAGEMENT COMPONENTS**

- **Supervision**
- **Questioning attitude**
- **Rigorous and prudent approach**
- **Communication**
- **Measuring performance**
- **Audit and review**
- **Corrective actions and improvements**

# Understanding Safety Culture

**Safety Culture Characteristics**

**Visible signs, Claimed Values, Basic Assumptions**

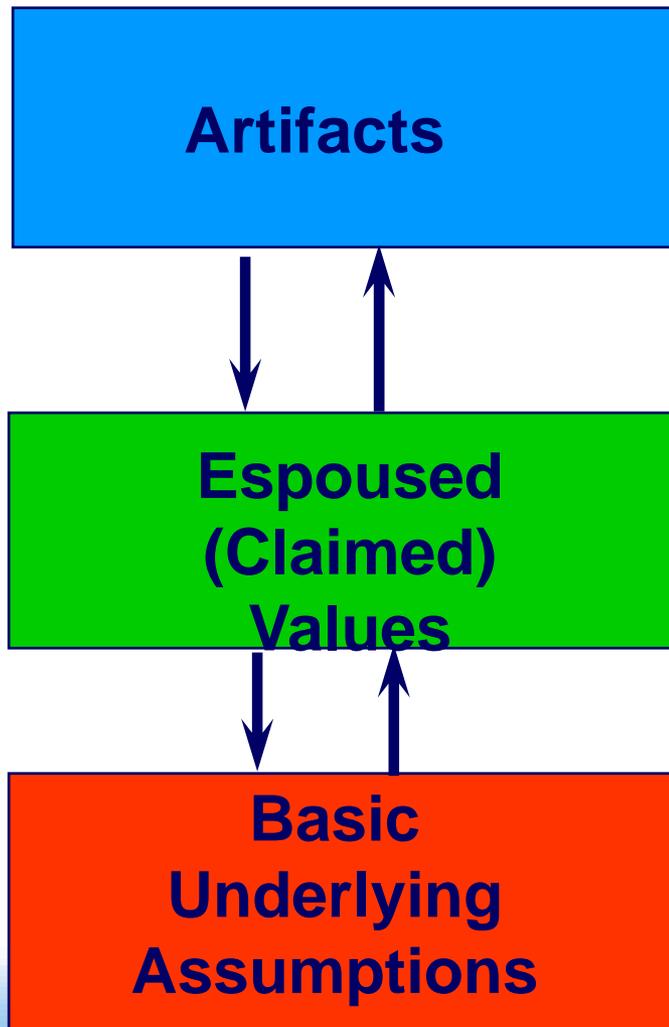
**TECDOC 1329: SC part of the Organizational Culture**

**INSAG-13  
Management of Safety**

**SRS-11: Stages of development**

**INSAG-4  
Organizational/Management & Individual Response  
Tangible & Intangible**

# Uncovering the Levels of Culture



**Visible products, behaviors, organizational structures and processes**

**Strategies, goals, philosophies**

**Unconscious, taken for granted beliefs, perceptions, thoughts, and feelings**

Schein, 1992

# Three-level model of Safety Culture

## Artifacts-Visible Signs

- **Top Management commitment to safety**
- **Documented safety policy**
- **Housekeeping**

# Three-level model of Safety Culture

## Espoused Values

- **High priority of safety**
- **”Blame-free” environment**
- **Learning organization**

# **Three-level model of Safety Culture**

## **Basic Assumptions**

- **A properly designed plant is inherently safe**
- **Safety and production go together/are in conflict**
- **Errors are opportunities for learning**

# **Safety Culture Characteristics**

- **Top management commitment to safety**
- **Visible leadership**
- **High priority to safety**
- **Systematic approach to safety**
- **Strategic business importance of safety**
- **Absence of safety versus production conflict**

# **Safety Culture Characteristics**

- **Relationship to regulators and other external groups**
- **Proactive and long-term perspective**
- **Quality of documentation and procedures**
- **Compliance with regulations and procedures**
- **Sufficient and competent staff**
- **Human Factors (MTO) knowledge**

# **Safety Culture Characteristics**

- **Clear roles and responsibilities**
- **Openness and communications**
- **Motivation and job satisfaction**
- **Involvement of all employees**
- **Good working conditions with regard to time pressure, workload and stress**

# **Safety Culture Characteristics**

- **Measurement of safety performance**
- **Proper resource allocation**
- **Collaboration and teamwork**
- **Organizational learning**
- **Good housekeeping**

# Assessing Safety Culture

## Assessment Methods

- **Interviews**
- **Focus Groups**
- **Questionnaires**
- **Observation**
- **Document review**
- **A mixture of approaches**

# Assessing Safety Culture

- **SRS-11 & TECDOC 1329:**  
**Symptoms of a weakening safety culture**
- **IAEA Topical Issues Conference 1998:**  
**Shortcomings in Safety Management –  
Common symptoms, Causes and  
Recoveries**

# **Safety Culture - Good signs!**

**Prevailing state of mind focused on safety and characterized by:**

- a continuing search for ways to improve safety,**
- constant awareness of what can go wrong,**
- feelings of personal accountability for safe operation, and**
- feelings of pride and ownership in the plant.**

# **Safety Culture - Good signs! (cont.)**

- **Disciplined approach to operations by a staff which is:**
  - highly trained,**
  - confident but not complacent,**
  - following procedures, and**
  - utilizing good teamwork and communications.**

# **Safety Culture - Good signs! (cont.)**

- **Sound technical basis for actions where:**
  - procedures are up-to-date,**
  - plant equipment is maintained at a high state of performance,**
  - the design basis is up-to-date,**
  - technical documentation is developed for plant changes, and**
  - limits of the design bases are observed.**

# **Safety Culture - Good signs! (cont.)**

- **Rigorous self-assessment is performed and:**
  - **facts are faced**
  - **bad news are accepted, and**
  - **problems are dealt with openness and promptly**

# **Symptoms of a Weakening Safety Culture**

- **Lack of systematic approach**
- **Procedures not properly serviced**
- **Number of violations increasing**
- **Verification of readiness for operation/maintenance**
- **Incidents not analyzed in-depth and lessons not learned**

# **Symptoms of a Weakening Safety Culture**

- **Increasing backlog of corrective actions**
- **Employee safety concerns not dealt with promptly**
- **Disproportionate focus on technical issues**
- **Lack of self-assessment processes**
- **Resource mismatch**

# Symptoms of a Weakening Safety Culture

- **Failure of corporate memory**
- **Low status of QA function**
- **Role of headquarters**
- **Lack of ownership**
- **Isolationism**

# **Symptoms of a Weakening Safety Culture**

- **Lack of learning**
- **Unwillingness to share or co-operate**
- **Failure to deal with findings from independent reviews**
- **Deficiencies in the regulatory body**
- **Poor housekeeping**

# Stages of Development of Safety Culture

## Stage 1

**Safety management is determined by regulations and rules** (Compliance)

## Stage 2

**Good safety performance becomes an organizational goal** (Performance)

## Stage 3

**Safety performance can always be improved** (Process)

# Stage 1- Regulation Driven

- **Organization sees safety as an external requirement and not as an aspect of conduct that will help the organization to succeed**
- **There is little awareness of behavioral and attitudinal aspects of safety performance**
- **Safety is seen very much as a technical issue**
- **Mere compliance with rules and regulations is considered adequate**

# Stage 2 - Management Driven

- **Management perceives safety performance as important even in the absence of regulatory pressure**
- **Growing awareness of behavioral issues**
- **Safety Management methods comprise technical and procedural solutions**
- **Safety performance is dealt with in terms of targets or goals**
- **Begins to look at the reasons behind safety performance trends and seeks the advice of other organizations**

## **Stage 3- Continuous Improvement Driven**

- **Has adopted the idea of continuous improvement and the learning organization**
- **Everyone in the company can contribute**
- **People understand the impact of behavioral issues on safety and measures are taken to improve behavior**
- **Progress is made one step at a time and never stops**
- **The organizations asks how it might help other companies**

# **Korean Culture (Historic) : Regulatory Body**

- **Inherent Rigidity**
  - **Self-reinforcing equilibria:**
    - **Control/Management of Organizations**
    - **Securing and sustaining (individual behavior)**
  - **Shared Value**
  - **Capacity and judgment**
- Renovation target (Global trend)**

# **Korean Culture (Historic) : Safety Culture in NPPs**

- **IAEA driven awareness of safety culture**
- **Corporate atmosphere or culture: safety is understood/accepted as the first priority →  
Safety Culture**
  - **Institutional Arrangement**
  - **Strengthening Safety: Concerning Complacency**
  - **Want more Deregulation (market) : Reducing Labor work**
  - **Shared Values are given**

# **Korean Culture (Historic) : Safety Culture in NPPs**

- **How about RP ?**
  - **Emphasized always but Alienated because lacks of mishaps (Complacency) ?**
  - **ALARA Culture is clear but it's priority in the Organizational Management ?**
  - **Shared Values are well known but its acceptance by employees ?**
  - **Capacity versus performance ?**
  - **Attitude and Behavior of all level personnel ?**

# **RADIATION PROTECTION CULTURE**

## **Key Words**

- **Awareness of RPC**
- **Institutional Arrangement (External Constraints) through commitments and leadership by all management levels**
- **Psychological Constraints: Shared Value → power and interest**
- **Motivation**
- **Employee's attitude and behavior**

# **RADIATION PROTECTION CULTURE**

## **Espoused Values**

- **High priority of radiation protection**
- **”Blame-free” environment**
- **Learning organization**

# **RADIATION PROTECTION CULTURE**

## **Employee's Attitude and Behavior**

- **Avoidance: inaction, blame, change**
- **Motivation: autonomy, competence, relatedness**
- **Personal Health first and sharing values**

# Improving and Enhancing RPC

- **Clearly recognized value in Org.**
  - **Accountability and ownership**
  - **Integrated RPC into all activities**
  - **Exist a leadership process**
  - **Learning driven**
- **Top management commitment, ownership, involvement of all employees and proper balance between **Values and Performance****

# CONCLUSION

- **Stage of Radiation Protection Culture**
  - **Knowledge**
  - **Rule**
  - **Skill**

# FINALE

- **Asia has a history and culture of “tacit knowledge”, “hands-on training”, integration of “brain power” and “muscle power”, “whole body learning” and “emotional intelligence”**
- **Radiation Protection Culture is the way of thinking and the way of doing, which means awareness and work is the whole body skill basis**



**Thank you for your attention**