Practically Improving Safety Culture within Regulatory Body

IAEA International Conference on Human and Organizational Aspects of Assuring Nuclear Safety – Exploring 30 Years of Safety Culture

22-26 February, 2016
IAEA, Vienna, Austria

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Highlights of Presentation

- Importance of Safety Culture for Regulatory Body
- Core Values - Safety Culture at PNRA
- Presenting Role model at National / International level
- Safety Culture Self Assessment (SCSA) at PNRA
- Safety Culture improvement activities and communication of outcomes of SCSA
- Envisaged Improvements
- Learning Horizon
- Conclusion

Introduction

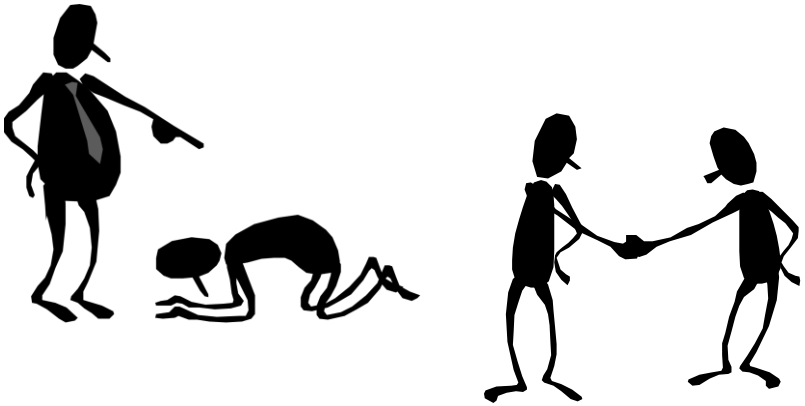
Weak safety consciousness is one of the major contributors that attributed to major accidents in high reliability organizations world wide.

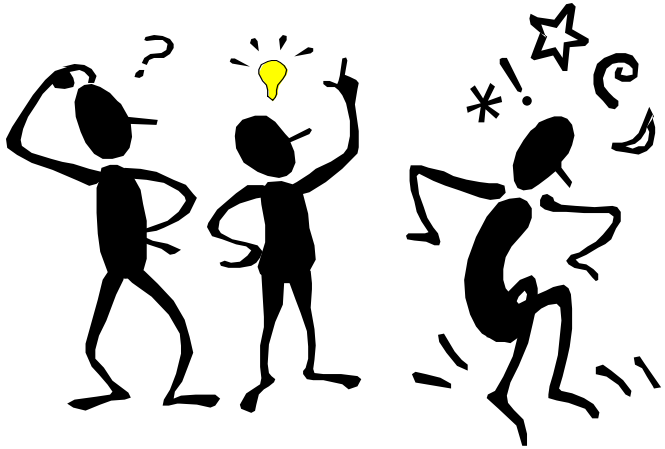
Major accidents in nuclear industry prominently highlighted the importance of safety culture for all type of organizations involved in nuclear business operators, vendors, regulatory bodies, etc.

Definitions of Culture

- **There are many definitions of ‘culture’**
- **Definitions generally emphasise either of these two:**

...culture as patterns of behaviour and interaction

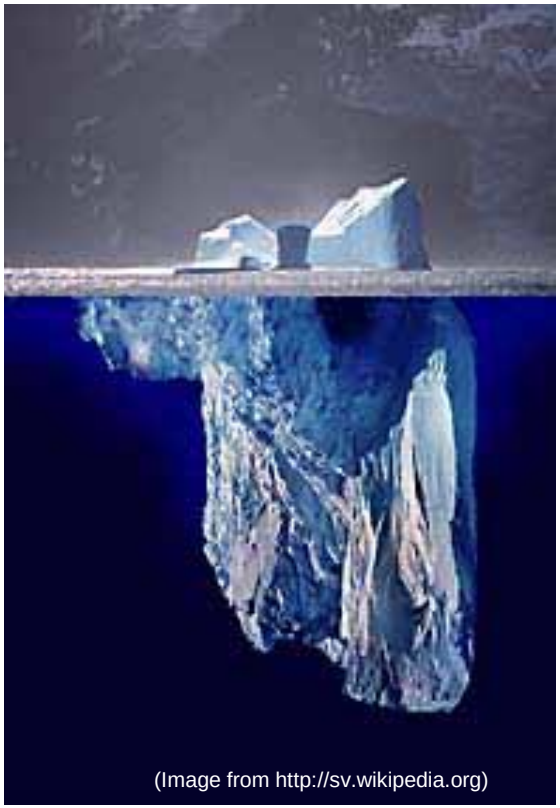




...culture as systems of thought

Culture as an Iceberg

9/10 of the iceberg is under water...

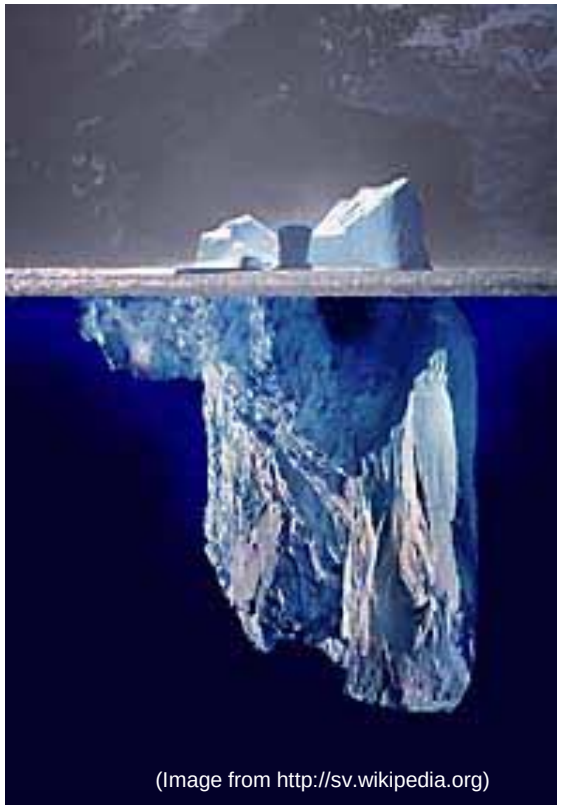


Above the surface we find visible aspects of culture: objects, actions, talk, text.....

Under the surface we find:

- Norms
- Values
  - Espoused
  - Tacit
- Basic assumptions about reality

Culture as an Iceberg


(Image from http://sv.wikipedia.org)

The iceberg metaphor does not provide a simple definition of culture. Rather it creates an awareness about the complexity of the concept of culture.

It also highlights the importance of *interpretation* when it comes to culture, since what we can observe is only a small part.

Cultural Expressions

Behaviour

Physical expressions

Verbal expressions

From Expressions to Interpretations

- What we can see and hear (stories, language use) is one thing
- The meaning of this is quite another thing
- What meaning we attach to something is an effect of what we assume
- Interpreting culture thus means that we must know which assumptions we make…
- it requires a ‘theory’ of culture!

Organizational Culture

Organizational culture is the set of common norms, values and views that develop in an organization when its members interact with each other.

Safety Culture

Safety Culture is that assembly of characteristics and attitudes in organizations and individuals which establishes that, as an overriding priority, protection and safety issues receives the attention warranted by their significance.

(The 2007 IAEA glossary)

Importance of Safety Culture for Regulatory Body

- After Fukushima accident, IAEA report on “regulatory effectiveness” and “Human Organizational Factors in Nuclear Safety” highlighted;

Consideration of Safety Culture Aspects in Regulatory Activities at PNRA

- The consideration of safety consciousness remained an important part of regulatory business at PNRA in the form of core values since its inception.
- Core values included;
  - Integrity
  - Transparency
  - Independence in Decision Making
  - Competence and Professionalism
  - Mutual Respect
  - Caring and Compassionate Attitude

Presenting Role Model at National / International Level

1

Good Safety Culture at regulatory body positively affects safety culture at operating organizations. PNRA endorsed this fact and in order to present itself as role model at national level, PNRA initiated Safety Culture Self Assessment (SCSA) in 2013

2

The completion of SCSA at regulatory body also presented PNRA as lead regulatory organization at international level

Safety Culture Self Assessment (SCSA) Project at PNRA

SCSA Project with IAEA

Project

The project was initiated with IAEA to conduct SCSA at PNRA with the help of IAEA under Technical Cooperation (TC) Project

Training Material

IAEA prepared training material by involvement of international experts for conducting SCSA. PNRA also shared feedback in the development of this training course

Team Selection

- Due to difference in nature of safety culture assessment activity in comparison with other routine regulatory activities, IAEA shared criteria for team selection.
- PNRA selected multidiscipline team consisting of twenty two (22) officers with team leader representing management.
- Representation of almost all parts of organization with different thinking / perspective was made in the team to avoid unidirectional thinking.

IAEA Training for SCSA Team

Training of the team on SCSA methodology;

1	2
Understanding of Safety Culture and its importance for any organization including regulatory body	Safety culture assessment tools (observations, focus group, interviews, survey and document analysis) and analysis (descriptive / normative)

Training on Regulatory oversight of safety culture;

1	2	3
Methodology of safety culture inspections of licensees	Design of training course for inspector responsible to conduct safety culture inspections	Training of inspectors for safety culture inspections

Workshop on Safety Culture for Senior Management

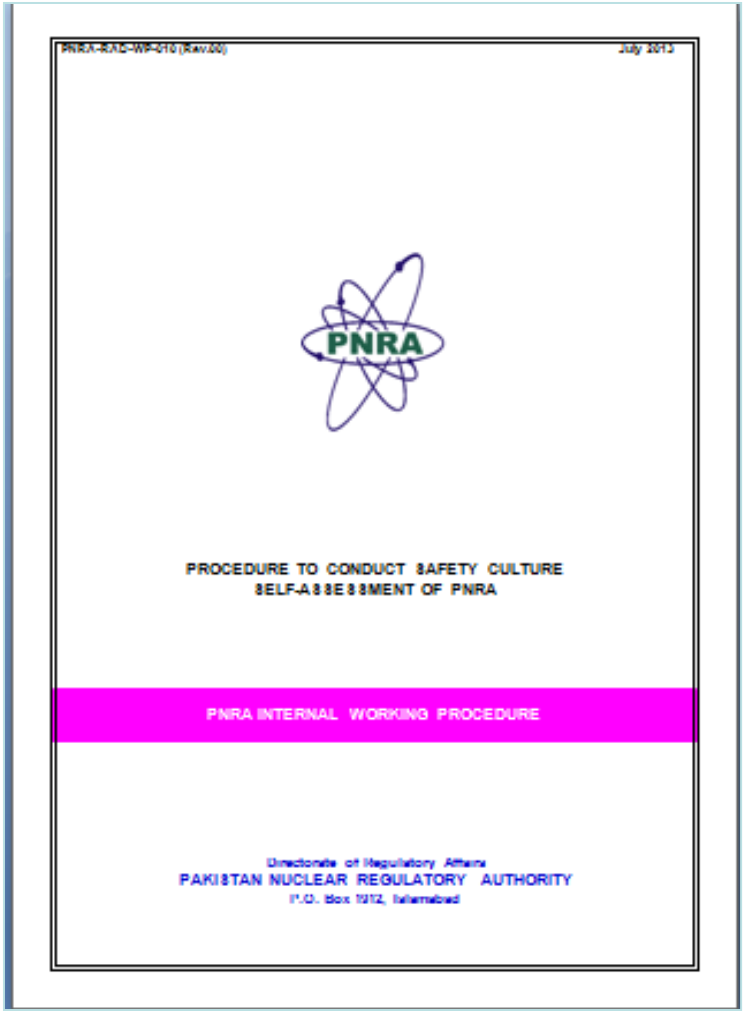
IAEA conducted workshop for PNRA senior management to cover :

- Understanding of Safety Culture and why it is important for regulatory body
- Purpose of SCSA activity and its effectiveness for PNRA
- Safety culture assessment tools (observations, focus group, interviews, survey and document analysis) and analysis (descriptive / normative)

Planning for Implementing SCSA

- The procedure for SCSA was prepared to document following;
  - Plan for implementation of SCSA
  - Distribution of responsibilities
  - Timeline for implementation of SCSA

- Periodic meetings within team and with management.



Pre launch Activities / Awareness Campaign

The purpose of awareness campaign was to;

- Brief about SCSA to everyone in PNRA
- Convey expectations regarding providing realistic feedback

Different modes utilized for this campaign were presentations sessions, emails and display of posters

Awareness resulted in active participation of PNRA in implementing SCSA tools

Implementation of SCSA Tools

Observations

Observations made during routine working and remained continued during implementation of SCSA tools in parallel

Interviews

Seventy seven (77) personnel from different hierarchy levels were interviewed

Document Analysis

Fifty (50) documents of different category were analyzed

Surveys

Survey questionnaire circulated

Focus Groups

Ten (10) focus groups conducted

Storage of Data Collected from Implementation of SCSA Tools

1. Almost 1900 cultural facts were collected during implementation of five SCSA tools
2. Data generated from SCSA tools was forwarded to team leader for its consolidated storage
3. Data access was restricted for everyone except SCSA team members

Descriptive and Normative Analysis

Descriptive

‘is’

Based on data and its cultural interpretation

Normative

‘should’

Based on data, cultural interpretation with reference to standard

Analysis of Data - Safety Culture Assessment

Normative, evaluative analysis

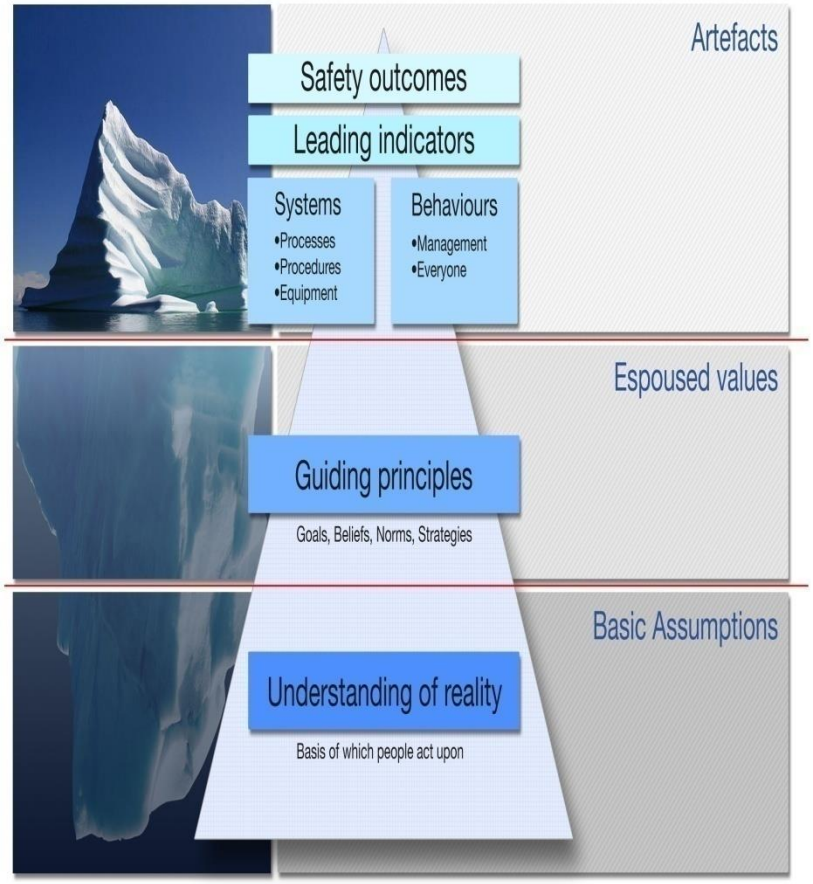
Descriptive Analysis: Images of culture

Cultural themes	Cultural Themes	Cultural Themes	Cultural Themes	Cultural Themes
Cultural facts	Cultural facts	Cultural facts	Cultural facts	Cultural facts
Interview data	Survey data	Focus group data	Document data	Observation data

Descriptive Analysis

- Grouping of cultural data performed to handle large amount of data.

- IAEA experts shared valuable feedback to improve descriptive analysis during support mission invited by PNRA;



Descriptive Analysis

- The methodology of developing “bubble diagram” was shared by experts to explore cultural themes starting from visible part of culture i.e. cultural facts collected during implementation of SCSA tools to explores beliefs and finally basic assumptions at the deeper part of ice berg.

- Descriptive analysis was refined by SCSA team using bubble diagram methodology.

Descriptive Analysis of Data from Survey

Cultural Data Collected from Survey Questionnaire

Cultural Themes from Survey Data

- **Organizational Maturity / Progression**
- **Team work / Unison**
- **Desire for Improvements**

Organizational Progression converted to overarching cultural theme due to its representation from other SCSA tools

Team work / unison and **desire for improvement** provided inputs to other overarching themes cultural themes e.g. friendly working environment

Sample Bubble Diagram

Outcome of Descriptive Analysis

Descriptive analysis resulted in identification of;

a. Cultural themes emerged from each SCSA tool

b. Overarching cultural themes emerged from various SCSA tools

Normative Analysis

- Normative Framework
  - PNRA started with IAEA normative framework (i.e. GS-G-3.5) and modified it to make it applicable to regulatory body.
  - The framework utilized for normative analysis at PNRA consisted of five (05) safety culture characteristics and thirty six (36) attributes under these characteristics.

- Normative analysis was performed to link safety culture attributes with applicable overarching cultural themes.

Finalization of PNRA SCSA Project

After completion of descriptive and normative analysis, IAEA support mission was again invited to review analysis performed by SCSA team

Outcomes of PNRA SCSA project was finalized after incorporating valuable feedback of IAEA experts shared during support mission

Major Outcomes of PNRA SCSA

- SCSA highlighted strong areas of safety culture at PNRA including organizational progression to meet current and future needs and friendly working environment within organization.

- Some areas having negative contribution to safety culture were also identified from SCSA for which actions are being planned for converting these into strengths.

Communication of Outcomes of PNRA SCSA

Outcomes of PNRA SCSA project were communicated to PNRA management in communication session which comprised of;

a. Brief about SCSA activity carried out by PNRA team

b. Theory of Culture and its assessment

c. Overarching themes emerged from descriptive analysis along with basic assumption and factors driving these cultural themes

d. Normative linkages of these cultural themes with modified IAEA normative framework to highlight strong and weak areas of safety culture at PNRA

PNRA SCSA Project

Team Selection (February - March 2013)

Twenty two (22) Members from different segments of PNRA

Training by IAEA Experts (One week each in April and May 2013)

- IAEA Safety Culture Self Assessment Methodology
- Safety Culture Oversight

Planning For Implementation of SCSA and Awareness Campaign (June-July 2013)

- Procedure Development
- Assignment of responsibilities
- Awareness to clarify objectives / expectations

Implementation of SCSA Tools (July 2013- August 2014)

- Observations
- Interviews (77)
- Focus Groups (10)
- Document Analysis (50)
- Survey

Descriptive Analysis (August 2014 – March 2015)

- 1900 cultural facts
- Grouping of data
- Bubble charts

Normative Analysis (April 2015)

- Modified IAEA normative framework (GS-G-3.5) for applicable to regulatory body
- Identified strengths and weaknesses

Safety Culture Improvement Activities and Communication of Outcomes of SCSA within PNRA

Incremental vs transformational

- **Incremental improvement:**
  - process, activity, or practice that benefits the organization
  - operates at the artifact and espoused values level

- **Transformative improvement:**
  - changes the fundamental approach
  - operates at the level of understanding

Sustainable culture change involves both

Nature of Culture Change

Incremental

Transformational

Culture Change

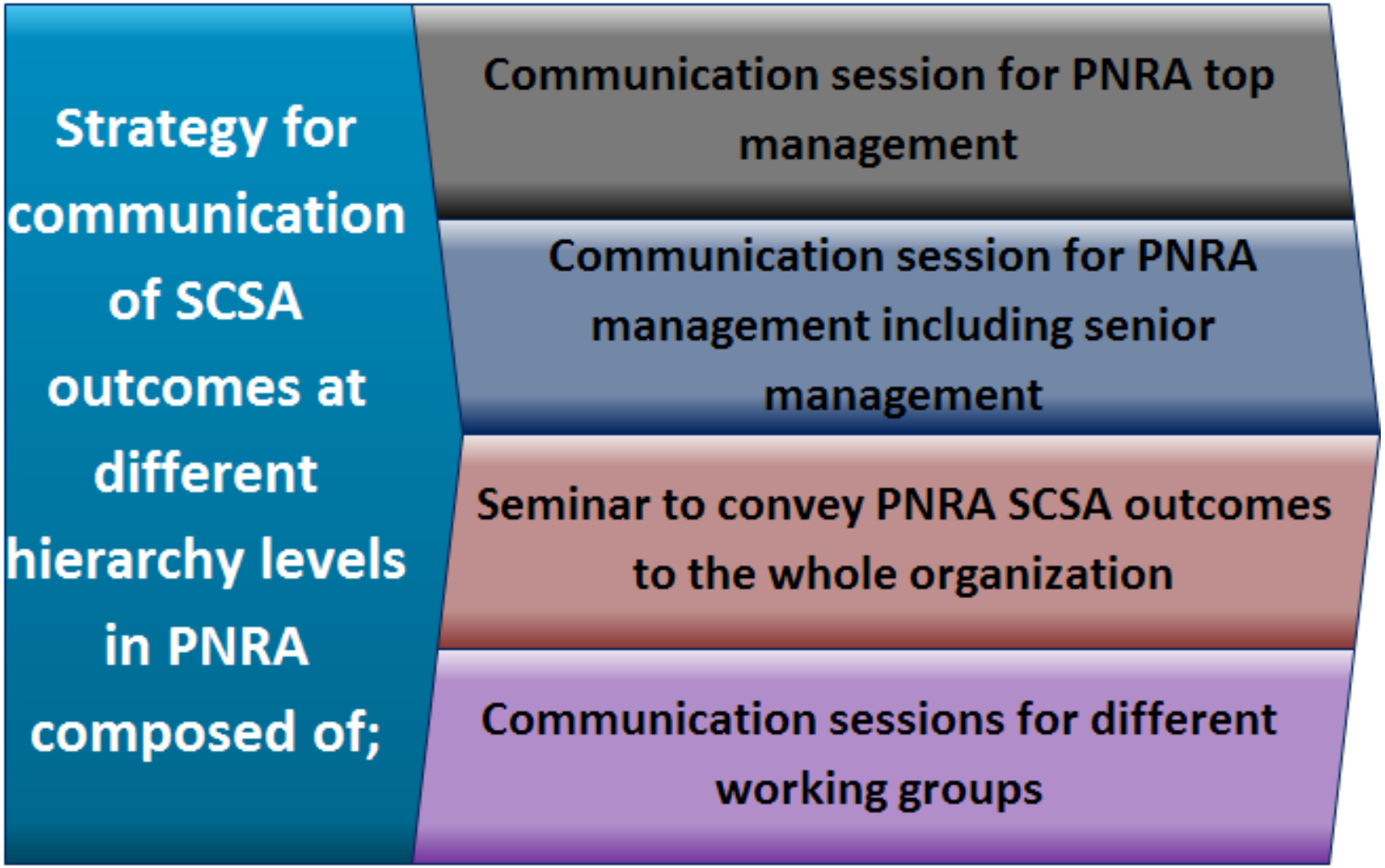
- Culture change is not just a one step process
- Change involves entangled and recursive processes that cannot be planned in detail because they need to be responsive to emerging understanding
- Change efforts are to be interpreted through cultural filters; existing patterns may be applied despite changing circumstances

Safety Culture Improvement Activities

- The basic concept of safety culture improvement activities lies in;
  - Widespread communication in PNRA regarding strong and weak areas of safety culture
  - Realization of individuals regarding factors contributing negatively towards safety culture

- Designing of specific improvement activities for converting weak areas of safety culture to strengths is in progress.

Strategy for Communication of SCSA Outcomes in PNRA



Envisaged Improvements

Shared Understanding of Safety Culture

- The dialogue sessions carried out during implementation of SCSA tools triggered thought process at PNRA which helped to promote shared understanding of safety culture for regulatory business.

- These sessions helped to establish shared space regarding;
  - concept of safety culture and its importance for regulatory body
  - Impact of safety culture at regulatory body on safety culture at licensed facilities

Improvements in Regulatory Processes by Incorporating Safety Culture

- The outcomes of SCSA highlighted areas that need to be considered for further enhancing effectiveness of regulatory processes by following ways;
  - Revisiting structure of core regulatory processes to improve their effectiveness by incorporating concept of safety culture
  - Effective implementation of regulatory processes by individuals having better understanding of safety culture and its impact on nuclear installations, radiation facilities and activities.

Regulatory Oversight for Safety Culture

PNRA is currently carrying out safety culture oversight utilizing methodology presented in IAEA INSAG-4

One of the limitation of this methodology is focus on specific cultural areas that are selected for oversight. Some important cultural aspects could be missed if not selected for oversight

Learning from safety culture self assessment carried out at PNRA, regulatory oversight of safety culture is being improved using IAEA emerging methodology

Learning Horizon

Learning Horizon

- The learning journey started during implementation of Safety Culture Self Assessment (SCSA) at PNRA that helped to understand linkage of believes, basic assumptions with actions, attitudes, visible manifestations, etc.

- The learning journey is continued and is also useful for social interactions in the society.

Conclusion

- PNRA considers safety culture as important ingredient of its regulatory processes and conducted its self assessment.
- The importance for incorporation of safety culture principles in regulatory processes is growing day by day and learning from lessons of experience feedback including Fukushima accident.
- PNRA Safety Culture Self Assessment (SCSA) provided opportunity to highlight strengths / weakness to make safety culture at PNRA inline with international standards.
- Other regulatory authorities could also take support from PNRA in assessing their own safety culture.


Thank You!