ГОСУДАРСТВЕННАЯ КОРПОРАЦИЯ ПО АТОМНОЙ ЭНЕРГИИ «РОСАТОМ»

Safety Culture. Peculiarities of implementation for different professional associations and AOCs

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Safety in nuclear industry

«State Atomic Energy Corporation «Rosatom» (hereafter referred to as a State Corporation «Rosatom»)…..states that **safety assurance** of facilities where nuclear power used **is a strategic area of activity of top priority** and considered as a fundamental condition and precondition for operation of Rosatom's organizations in research and development, planning and surveying and production areas of nuclear power use».

«**Goals** of Rosatom's policy concerning safety assurance at the facilities where nuclear power used are **minimization of nuclear, radiological and industrial risks**, as well as striving **to exclude damage for the population and environment related to operation and decommissioning of facilities of nuclear power use**»

(Policy declaration of the State Corporation «Rosatom» concerning safety assurance of facilities where nuclear power is used)

Prerequisites of Safety Culture development

Three Mile Island accident, 1979

Chernobyl accident, 1986

Fukushima NPP accident, 2011

Deficiencies of equipment, procedures, training, safety and surveillance

Not sufficient emphasis to safety culture issues

Impact of hypothetical extreme external action

Nuclear safety culture is defined as the core values and behaviors resulting from a collective commitment by leaders and individuals to emphasize safety over competing goals to ensure protection of people and the environment.

…overall application in all industries using nuclear technologies

(Guidelines. Traits of a Healthy Nuclear Safety Culture. WANO PRINCIPLES 2013-1)

Safety Culture development history in IAEA recommendations

INSAG-1, 1986
Summary report on the post accident review meeting on Chernobyl accident. The term «***nuclear safety culture***» was introduced.

INSAG-3, 1989 Basic safety principles for nuclear power plants.
Safety culture is highlighted as the fundamental management principle.

INSAG-4, 1991 Safety Culture
A definition of safety culture was developed and this definitions became a classical definition for years: **«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-15, 2002 Key practical issues in strengthening Safety Culture.
Patterns of behaviors, values and concepts which define priorities and importance of safety culture issues for a company's activity as well as personal responsibility to ensure safety culture.

From 1986 to 2013 in more than 30 IAEA publications, including recently issued IAEA-TECDOC-1707 of March 2013 «Regulatory Oversight of Safety Culture in Nuclear Installations», active dynamics of safety culture issues review is traced.

Safety culture: what is it?

A concept «culture» is a way of workmanship, a way of accumulation and transfer of human experience, assessment and understanding. It allows to talk about long transformation processes, enhancement and improvement in all areas.

We are talking about **professional culture** in nuclear engineering where **safety assurance** is **priority number one**.

Professional knowledge, understanding of what is going on is the basis of «safety culture».

The term «safety culture», defined in OPB-88/97, is based on many elements:

Production safety,
Industrial safety culture,
Corporate safety,
Quality assurance culture,
Culture of safety assurance,
Personnel competence.

«Safety is internal necessity for everyone!»

Safety culture within uranium-mining and mining division of the State Corporation «Rosatom»*

Occupational Health and Safety Assessment System (OHSAS) efficiency	**Leadership, knowledge and skills enhancement** • On-site practical workshop for Priargunsky Industrial Mining and Chemical Union (JSC PIMCU) – Identification of the top management role in safety management. **Outcome:** - Development of the behavior model of the top management to demonstrate personal role and adherence to safety. -Amendment of the acting action plan on OHS and FS • Interactive 3-days workshop for 25 top managers of PIMCU "Safety management. Efficient systems and techniques applied by managers (with practical audit). **Outcome:** - Development of the behavior model of the top management to demonstrate personal role and adherence to safety. - Preparation of personal plans to achieve target indicators in OHS and FS using leading indicators on Occupational Health and Safety Assessment System (OHSAS) • Interactive 2 days workshop on OHS and FS for JSC PIMCU "Safety management: efficient work practices for OHS and FS personnel". **Outcome:** - Development of leadership skills for OHS and FS personnel and knowledge on best practice in OHS management".	**Sustainable development** • Training and on the job training of internal coachers (5 days, 10 persons) • Development and introduction of behaviors audit standard **Project implementation deadline – 1 quarter 2014**	**Coaching (integration)** • 50 three days workshops for line managers of JSC PIMCU (**1000 persons** – 5 levels of management – from a foreman to the chief engineer of UGRU): "Safety management: Efficient systems and techniques applied by line managers with practical audit (workshops are conducted by consultants with internal coachers). • 15 two days coaching sessions for managers of all levels in JSC PIMCU to develop practical skills in application of efficient safety management systems and techniques and to ensure labor discipline (150 persons). **Outcome:** - Development of knowledge in best practices in behavioral risks management. - Development of the behavior model of the top management to demonstrate personal role and adherence to safety. - Mobilization to improve results in OHS and FS due to prevention of hazardous working conditions and unsafe behavior. - Preparation of personal plans to achieve target indicators in OHS and FS using leading indicators on Occupational Health and Safety Assessment System (OHSAS).

Experience in the development of the safety cul
the electrical energy division of the State Corpo
Rosatom

РОСЭНЕРГОАТОМ

SC model

Russian methodological approaches, SC documents

Results of safety inspections, investigation of NPP events

Working meetings with NPP representatives

IAEA/WANO meeting to develop a common SC model

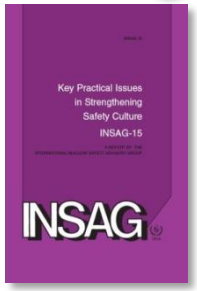
Results of Rosenergoatom activity in Safety Culture

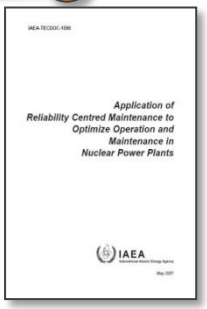
Results of SC level monitoring

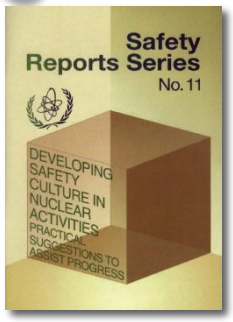
Results of peer reviews, WANO missions, IAEA

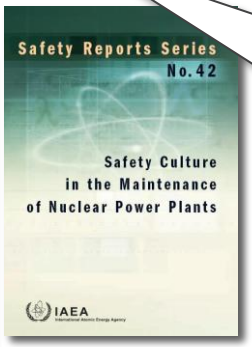
Participate in IAEA and WANO SC projects and missions

IAEA documents on SC: review and participation in development





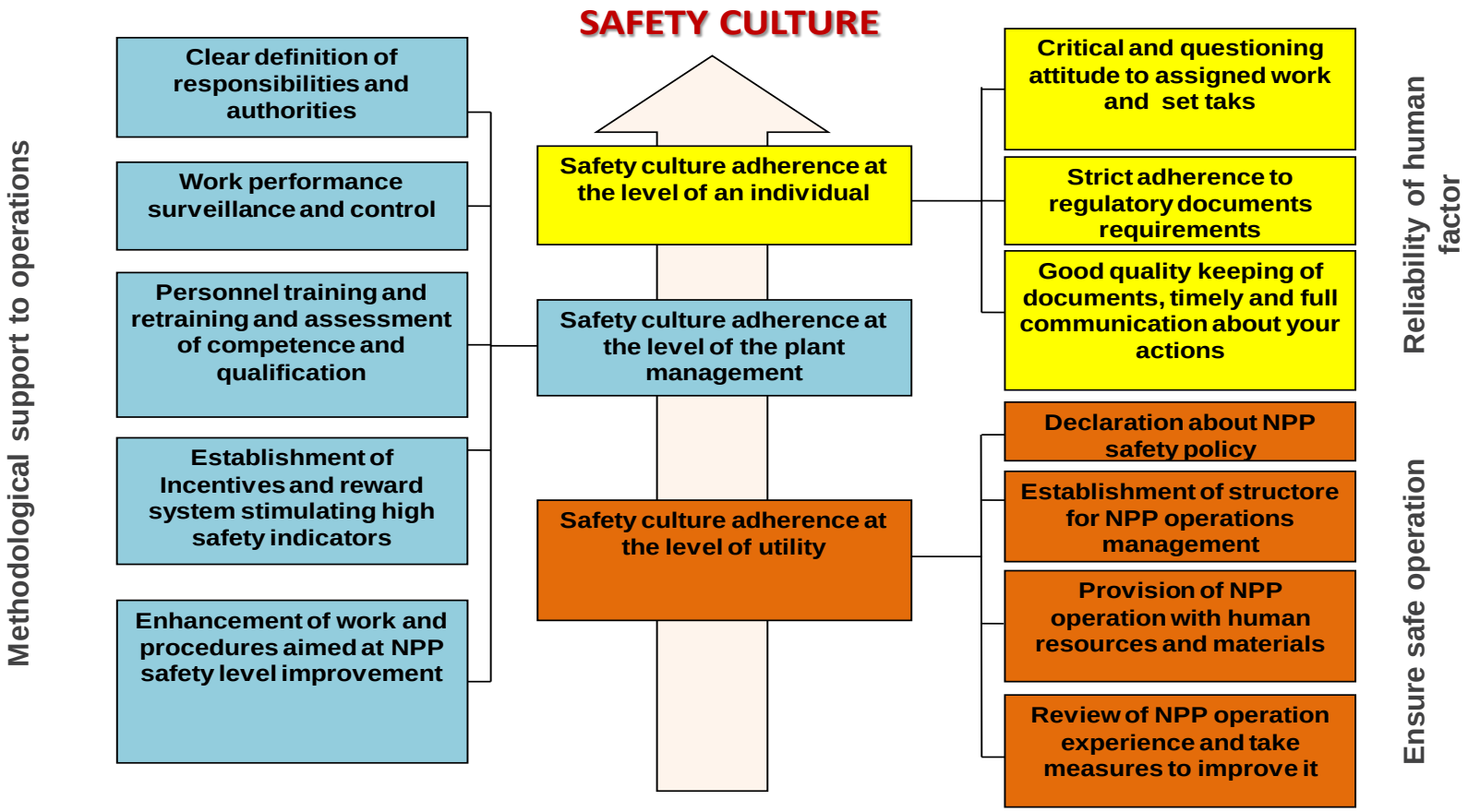




* - *Vertepa V.I., «Experience of SC enhancement in JSC «Rosenergoatom» (Strategic session on SC, Obninsk, 2014)*

Experience of safety culture development in the electrical and energy division of the State Corpo Rosatom

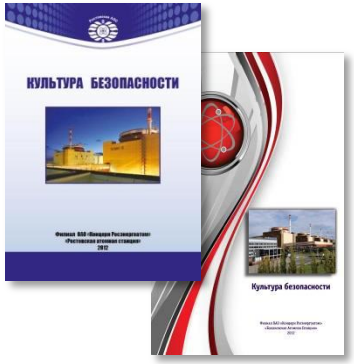
Key safety culture components



Experience of safety culture development in the electrical and energy division of the State Corpo Rosatom

Building a safety culture . Application practice

Development of guidelines and training materials designed to raise awareness of the importance of personal safety aspects



Improvement of training of the operation and maintenance personnel

Full-scope simulator of the Powe
№ 4 of Kalinin NPP

Improvement of maintenance and repair procedures

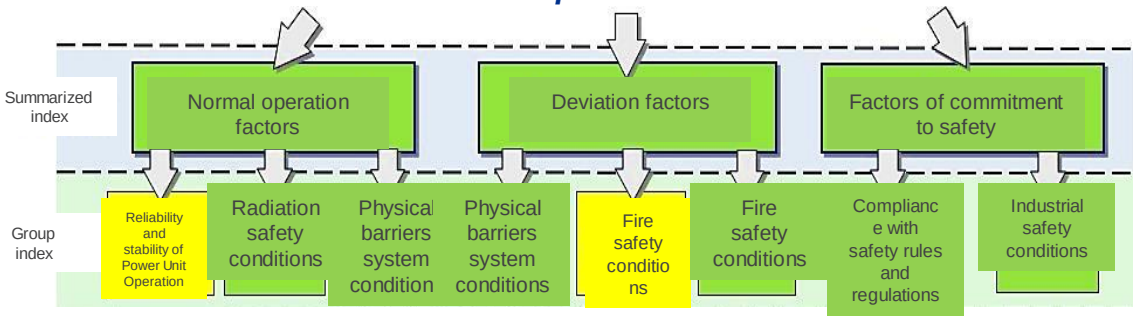
Replacement of the LPC at the Power Unit

RBMK
spent fuel storage container

Analysis and evaluation of safety culture

- personal comprehension of the importance of safety;
- knowledge and competence, arrangement of the staff trainir
- commitment to safety at all levels of the management;
- motivation, system of encouragements and punishments.

Application of the parameters of safe operation of the power units



The analysis allows to make a detail assessment of a condition of safe operation, to reveal the weaknesses for corrective measures to be taken, to give out recommendations for some areas of operation to be improved

Safety culture in the structure the Innovations Management Unit of the State Corporation Rosatom

Safety culture is an integral part of the general culture of production and is made of activities, administration and personnel behavior to ensure the safety of radiation-hazardous facilities.

Development of a safety culture based on requirements :

NP-016–05 General safety provisions for NFC facilities

RB-034-05 Recommendations on the recruiting, training, retraining of the operational staff of NFC facilities

RB-047-08 Method of safety culture assessment in NFC enterprises

(SanPiN 2.6.1.07-03. Hygiene requirements for the design of nuclear industry enterprises and installations (СПП ПУАП-03))

* - *Bogoryatskih T.V., 'safety culture-conditions, issues» (the international nuclear forum, St Petersburg, 2013)*

Safety culture in the structure the Innovations Management Unit of the State Corporation Rosatom

RB-047-08

Area	Safety culture indicators	Execution
According to the safety policy	- *Statement of safety policy determines the priority of safety.* - *The policy statement on safety has been brought to the attention of all staff, including the staff of contractors, so that this policy has been understood and applied in practice.* - *The adequacy and the execution status of the safety policy is evaluated on a regular basis.*	***as part of the QMS***
At the level of management	- *Allocation of responsibility, authority and direction of the interaction is strongly established and documented for all personnel responsible for issues that affect safety. Regular meetings on safety issues. There are instructions for implementation and monitoring of all activities connected with safety. and others ...*	***in accordance with the requirements of the rules, regulations and organizational documents***
Staff recruitment and competence	- *The company identified and documented the requirements for qualification of personnel.* - *For each employee performing duties related to safety, organized and supported by the necessary accounting system training, access to independent work and training, as well as documenting the employee's qualification conformity assessment requirements. and others ...*	***in accordance with the requirements of the rules, regulations and organizational documents***

Based on the criteria of RB -047 -08 and methods of evaluation in JSC "IRM" a high level of safety culture

Nuclear security culture

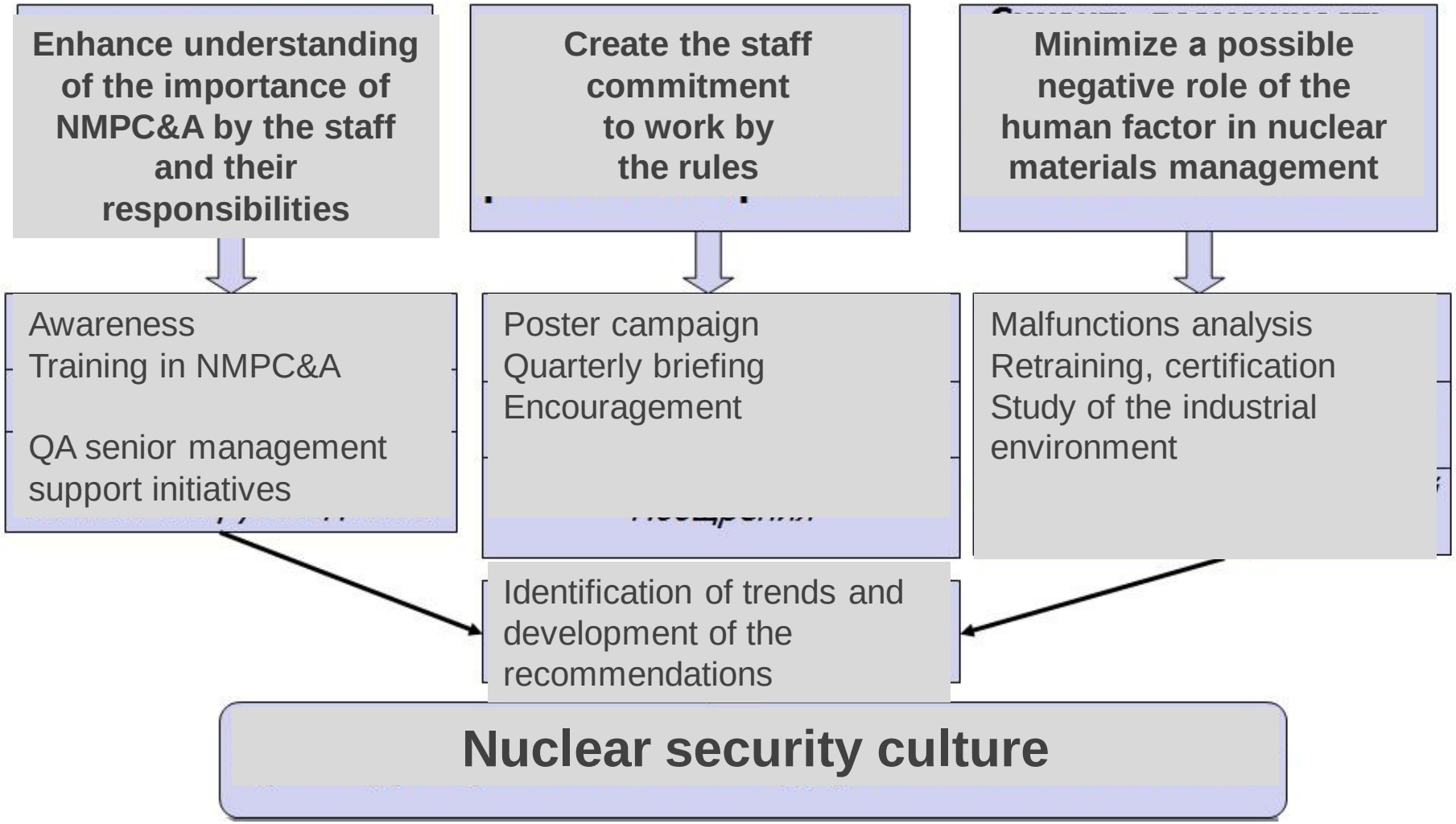
Physical nuclear security culture is a set of characteristics, principles, attitudes and behavior of individuals, organizations and institutions, which acts as a means for maintaining and strengthening nuclear safety.

Tasks for accounting and control and physical protection of nuclear materials

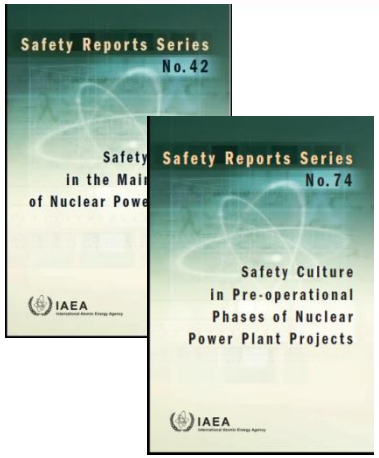
- The main objective of the system of physical protection of nuclear materials is to make actions against theft of inhibition and prevention of sabotage of nuclear material and/or installation
- The main task of the system of accounting and control is to determine the cash amount of nuclear material, to warn and to prevent unauthorized use, as soon as possible to find a possible shortage

(IAEA Nuclear Security Series No. 7, September 2008)

The systematic approach to reach the goals of the nuclear security culture



Safety culture and specificities of the far East vendors



The main challenges of the safety culture in the construction phase in new countries :

- Nuclear power plant construction projects involve representatives of different nationalities, languages, cultures, customs, values, religions and traditions influencing the development of a culture of safety
- Preparation of multinational teams more expensive in terms of achieving the optimum team work

World Nuclear Industry Status Report

Korea Times (South Korea): Endless scandals hit nuclear power suppliers

Corruption at KHNP has led to nearly a quarter of the nuclear reactors to stop

http://www.worldnuclearreport.org/Korea-Times-South-Korea-Endless.html

The Fukushima Nuclear Accident Independent Investigation Commission

What must be admitted – very painfully – is that this was a disaster "Made in Japan." Its fundamental causes are to be found in the ingrained conventions of Japanese culture: our reflexive obedience; our reluctance to question authority; our devotion to 'sticking with the program'; our groupism; and our insularity.

K. Kurokawa

http://www.nei.org/corporatesite/media/filefolder/Summary_of_Independent_Investigation_Commission_on_Fukushima_7-2012_2.pdf

Fundamentals of the State policy in the field of nuclear and radiation safety

… in order to achieve the objective of ensuring nuclear and radiation safety efforts should focus on '...the development of safety culture in nuclear energy use facilities in line with international practices, and on the staffing of all types of works related to the use of Atomic Energy and the impact on safety …»

(«Fundamentals of the State policy in the field of nuclear and radiation safety of the Russian Federation for the period up to 2025 , item 10. the President of the Russian Federation, March 1, 2012 section 3)

Conclusions

1. Safety Culture is now a commonly used term. There is a need for a common understanding of its nature, however, and for means of turning what has been simply a convenient phrase into a concept of practical value.(INSAG-4).

2. The safety culture should be actively developed at all nuclear facilities, as well as further developed in relation to the full range of phases of the life cycle of the nuclear facility.

3. For different groups of workers in the nuclear industry, the “safety culture” is different because it is inextricably linked with the nature of the professional activity. There are various tasks that require different approaches in the analysis.

4. There is a need for research on the impact of the professional environment in shaping the safety culture**.**

5. A special responsibility for the safe operation of nuclear and radiation-hazardous facilities lies with the staff. The staff is the owner of culture and knowledge being of critical importance. Professional competences, study the safety issues and operational experience, safety culture fundamentals should be kept and developed on the systematic basis.