STRONG SAFETY CULTURE AS A MEANS FOR PREVENTION

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ABSTRACT: The paper inhere treats some specific problems related with the management of safety culture in the conditions of high risk industries. Recently, the culture of safety is realized to be of high importance in order to guarantee that the respective organization and its employees have achieved high standards of safety. Normally the constructive aspect of safety culture includes the undertaken actions by the organization for improvement of safety. These particular actions represent the system for management of safety culture for the respective organization. A practical handbook for maintaining a strong safety culture is developed in order to help workers realize and believe in the main principles of a safe production.

KEY WORDS: Safety culture, management system, prevention.

INTRODUCTION

For first time the term “Safety culture” has been introduced after the nuclear disaster at the Chernobyl NPP in 1988 [1]. The full definition of Safety Culture is:

"Safety Culture is the set of enduring values and attitudes regarding safety issues, shared by every member of every level of an organization. Safety Culture refers to the extent to which every individual and every group of the organization is aware of the risks and unknown hazards induced by its activities; is continuously behaving so as to preserve and enhance safety; is willing and able to adapt itself when facing safety issues; is willing to communicate safety issues; and consistently evaluates safety related behavior”

Safety culture is recently applied in all areas of industry, especially in high-risk productions, and it is extremely important for obtaining high standards of safety within the company.

The current paper describes the main features of safety culture, systems for its management and ways for assessment. Discussion has been made regarding the efficiency of questioners, inquiries and checklist, widely used for assessment of safety culture. An universal questionnaire has been developed, which can be used as a base for creation of checklists and inquiries in any branch of industry.

CHARACTERISTICS AND INDICATORS OF SAFETY

The experience taken as a result of world severe accidents determines the necessity of critical approach and a tendency for deep understanding of all questions related to safety and prevention following the objectives:

- Establishment of politics and procedures in which safety and protection of workers are questions of top priority;
- Fast reaction and diagnostics of safety and prevention issues and their correction
consequently in regard with their importance;
- Clear definition of responsibilities in organizational level – leaders, senior managers, supervisors, safety officers, workers;
- Professional training and qualification in regard with safety for the entire personnel;
- Clear distinction between the powers of individual employees in taking decisions about safety;
- Creation of structures and communication channels supplying detailed information about safety questions in all operational levels;
- Assessment of safety culture on regular basis, definition of issues and flows, applying corrective actions for improvement, getting continuous feedback;
- Commitment of leaders and personnel to all levels in improving of safety culture.

According to theory safety culture has the following characteristics [2]:

- **Commitment** - describes the extend of positive attitude the employees have towards safety starting from the leaders and top managers and finishing with end worker. Top management must motivate workers to keep high levels of safety by their experience and example;
- **Behavior** - reflects the way different persons in the company behave in regard with safety maintenance and improvement. The role of managerial staff here is also of key importance;
- **Awareness** – describes the extend to which management and employees are familiar with risks and safety issues, related with the respective production;
- **Adaptability** – describes the ability of personnel and management to learn from near-miss events and accidents and the actions they take in order to enhance the level of safety within the organization;
- **Information** – describes the way information is distributed among personnel. In that relation safety issues and concerns should be reported immediately. Information must be provided to the correct supervisors in order to avoid miscommunication and resulting safety issues and hazards.

- **Justness** – describes how the attitude of workers to safety is evaluated by management. Safe behavior and reporting of safety issues must be encouraged and concealing of human errors and unsafe behavior must be discouraged.

The characteristics of safety are quite general. In order to evaluate them each characteristic is divided in a couple of safety indicators. Safety indicators are defined in table. 1.

<table>
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<tr>
<th>Characteristic</th>
<th>Indicators</th>
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| **Commitment** | - Management concerns;  
- Realizing the importance of safety;  
- Priorities in safety;  
- Safety procedures, instructions and requirements  
- Personal involvement and responsibility for safety; |
| **Behavior** | - Employees behavior with respect to safety;  
- Mutual expectations and encouragement;  
- Job satisfaction;  
- Adequate equipment; |
| **Awareness** | - Attitude to unreported hazards and human errors;  
- Awareness of job induced risk;  
- Concern for safety; |
| **Adaptability** | - Pro-activity to prevent negative happenings;  
- Corrective actions with respect to negative events;  
- Employee feedback and reporting; |
| **Information** | - Availability of information;  
- Communication of information related to the production process;  
- Training and instructions;  
- Development of safety issues reporting system;  
- Use of the reporting system;  
- Consequences of safety reports;  
- Communication of safety related information;  
- Information exchange about safety issues; |
| **Justness** | - Evaluation of safety related behaviors;  
- Perception of evaluation;  
- Defining responsibility |

Table. 1. *Indicators of safety* [2]
The modification of Safety culture systems with time has been illustrated by an evolutionary model, created by ECAST SMS Working Group [2, 3], divided into 5 evolutionary levels:

**Level 1: Pathological/emerging** - Safety is defined by technical and organizational measure in accordance with safety regulations. The responsibility of safety department and safety officers are not clear in regard with safety. Accidents are assumed to be unavoidable and a part of the job. Supervisors and staff are not committed to safety.

**Level 2: Reactive/managing** - The rate of accidents in the company is average and most of them are serious. Profits are with priority over safety investments and management. No commitment of leaders and top executives with safety. Safety is perceived only as a set of rules and procedures. All accidents are regarded as preventable and caused by unsafe behavior (human errors). The involvement of senior managers and supervisors with safety and health is related only with using of punishments when accident rates increase. Improvements are made only after accidents.

**Level 3: Calculative/involving** - Accident rates are relatively low, but their frequency doesn’t change with time. These companies are “in the middle of the road”, they apply technical and organizational measure for safety according to all regulations. Managers recognize that accidents are dependant on wide range of factors and the main cause for them are wrong decisions. Employees want to correlate with management to improve health and safety. The most workers accept personal responsibility for their own safety. Safety performance is actively monitored and the data is used effectively. The company has systems in place to manage hazards, but safety measures are applied mechanically. Accidents are not used as a source of further experience.

**Level 4: Proactive/cooperating** - The majority of staff in the organization is convinced that health and safety is important from both a moral and economic point of view. Workers accept personal responsibility for their own and others’ safety. All personnel have strong commitment to safety with clearly recognized values. There is good dialogue between workers and management. Proactive measures are taken in order to prevent accidents. All safety activities and performance are actively monitored.

**Level 5: Generative/continually improving** – These are companies without recordable accidents or high potential incident on long term basis (normally years). All employees and management believe that prevention of injuries, incidents and accidents is top priority. There is strong communication relation between management and workers. All safety issues, human errors are reported without fear of punishment; safety training is performed on regular basis. Potential risks and hazards are continuously investigated, preliminary expected and staff is prepared for them. Safety as a right and value is put in front of production performance and profits. Organization uses a range of indicators to monitor performance but production is safety oriented. Health and safety at home are also promoted.
According to [4], indicators for a positive safety culture on managerial basis are the following:

- **Planning of an effective work process** – a part of leaders and management commitment to safety is not to press employees work with higher than normal production rates. Higher production rates could result in unsafe actions, injuries and accidents;
- **Managers actively involved in active monitoring** – Managers could demonstrate their leadership and commitment to safety by conducting informal safety tours on workplace, talk with employees and asking them for possible hazards and their solutions.
- **Managers getting actively involved in reactive monitoring** – Managers should participate actively in investigation of accidents, company damage, near-miss accuracies and occupational illness. As a result new safety trainings or working practice changes could be assigned.
- **Managers attendance on health and safety committee meetings** - the presence of a senior managers to approve decisions puts forward the priority of health and safety. Safety officers should be open to safety issues reported by workers. Feedback should be regular from and to workers. Meetings should be held on regular basis pre-arranged times. Attendance of all committee members is important and all of them must have effective health and safety training. All accident trends and near-miss incidents must be discussed and proper actions should be made.
- **Housekeeping** - Some companies use housekeeping standards as an indirect measure of safety. It is believed that maintaining work areas clean and tidy, regularly collecting waste and scrap, storing raw materials and finished products properly positively impact on the production process efficiency and is a prerequisite for prevention of injuries and incidents;
- **Communications** - Team leadership, involvement of workers on safety and open communication between workers and leaders result in better safety. Employees should be informed continuously about safety objectives and results of risk assessments. Feedback is important. Problems should be discussed on meetings, briefings, notice boards, electronic channels and opinion and possible solutions from workers should be taken into account.

**Bonus Schemes** - Improving production rates by stimulating workers with extra payment for overtime or over production work, rewarding zero accidents results in compromising safety - near-miss occasions and safety issues are neglected by workers and not reported.

**WORKERS BEHAVIOR MODELS FOR MAINTAINING STRONG SAFETY CULTURE**

On individual basis the following behavioral models could be applied divided in groups:

- **SAFETY FIRST**
  1. Maintaining safety is an uninterruptible process - Safety is a key objective and it is the most important of all indicators in the production process; Work must be performed safely even if it is complex and urgent to do;
  2. Safety is a common activity for the entire company and the single individual within -
Everyone has options, powers and obligations to gain safety; Everyone should realize and follow the rules and safety standards; Actively contribute to maintain safety! Set a personal example; Carefully clarify the cause for occurrence of near-miss events or dangerous deviation from the normal mode operation of systems and equipment; Share information with your colleagues for dangerous situations and the degree of danger;

3. Accidents can be avoided. Follow the basic steps for gaining safety:
   - DISCOVER the issue;
   - REPORT it immediately;
   - REDUCE THE DANGER TO MINIMUM;
   - CLEAR THE PROBLEM according to the approved procedures and instructions;
   - CHECK AGAIN.

4. On duty, observe the following basic safety rules: Always use the required PPE; Strictly follow all instructions and procedures; Predict possible hazards and be prepared for them; Do not continue work until all discrepancies and deviations are eliminated; All the time apply the methods for self control.

   ➢ FOLLOW THE PROCEDURES

Equipment is operated in accordance with established written procedures and instructions that have to be strictly and consequently followed.

➢ DO NOT PERFORM ACTION IF YOU ARE NOT SURE

1. Takes a conservative decision when you perform any activity, putting safety first.
   The conservative solution: Is the opposite of risk; Puts caution in front of courage; Requires additional guarantees; Is based on actual information.

2. Expect the unexpected - In taking of decisions take into account the potential risk in order to prevent worsening of the situation.

3. Use the concept for protection in depth - Inspect any protective barrier as the last one and only.

4. Do not allow questions being left unclear - Clarify and solve the issues and discrepancies, before continuing with actions; When you are not sure or do not know what to do, ask, or search for help; Do not continue if the procedure or work is beyond your competence and inform the responsible person for the respective job;

5. Avoid hasty decisions and actions;

6. Immediately report all problems.

➢ DO NOT CONCEAL MISTAKES

1. If you made a mistake
   - Transform it into experience and share it with others;
   - The prevention of mistakes repetition INCREASES THE SAFETY of your company

2. If your colleague made a mistake
   - Encourage him to report about it;
   - Your colleague is suffering of what happened. Support him;
   - Show respect. The accusations are worthless. Remember that each person can make a mistake;
   - Consider the possible causes of that mistake, in order to prevent its repetition.

3. Only intentional violation or mistake concealment may be a cause for imposing of punishment.

Mistake is a clear message that the technology, equipment, procedures or work place have a need of improvement.

➢ SELF-CONTROL MUST BECOME A HABIT

Use your self-control for concentration of your attention and prevention from possible mistakes. Apply the system for self-control following the next steps:

   - HOLD UP - Stop for a moment before you start work;
   - THINK OVER - Consider what to do;
   - ACT - Now act. Record your actions and results clearly and accurately;
   - ANALIZE - Analyze the results of your actions! If there are any deviations, report to your supervisor!

Some of the main questions related to self-control are:
1. Did I understand my task correctly?
2. Do I remember the safety rules?
3. Do I have the all necessary PPE?
4. Do I have the necessary knowledgebase and skills?
5. Do I need help?
6. Do I have proper procedures/instructions to do the job?
7. What are the single steps of the task assignment?
8. What are my responsibilities?
9. What are the responsibilities of others?
10. Before starting a machine or equipment – Am I sure that I mean, see, hear, point to the correct equipment?
11. What result I expect to have?
12. Are there any unusual conditions?
13. What should be my response if there are deviations from the normal operation?
14. What kinds of failures may occur?
15. What might be the consequences of a failure or a human error?
16. What should I do to prevent a failure?
17. What should I do in case of a failure?

The practice of self-control is the last barrier which can prevent mistakes.

➢ TEAMWORK

Teamwork increases the production output and is much more effective than the sum of the activities of each person individually. Basic principles of teamwork are:
1. Concentrate on the situation and the task, regardless of all personal differences - Do not allow irritation or humiliation. It is more important to understand and solve the problem rather than looking for guilt in someone else;
2. Show trust, respect and cooperation with your colleagues - Recognize the role and contribution of each of your colleagues to the overall work;
3. Take the initiative to improve the production process, procedures, equipment operation;
4. Set an example and follow the example of others - Accept criticism, listen to the others. With your personal example affirm a serious attitude to safety and contribute for a high quality of work performance;
5. Act in all situations professionally and efficiently, as a team;
6. Conduct clear communication - Use feedback for confirmation.

The most important words in teamwork are:
- "I admit that I really made a mistake!"
- "We are very proud of you!"
- "What is your opinion?"
- "Please!"
- "Thank you!"
- "WE"

And the most unnecessary word:
- "I"

The behavioral models described above have been summarized in a handbook, called “PRACTICAL HANDBOOK for maintaining high levels of safety culture within the company”.

The most important organizational and technical measures for safety including the description of the main signs and signals for safety are summarized in a second handbook.
CONCLUSIONS

The so developed handbooks are universal. They could be used by workers in various fields of industry to emphasize their commitment to safety and improve their safety culture.

These two handbooks could be used successfully as tools for self training in safety. They comprise the main principles of a strong safety culture, provoking the employees to share one and the same values and attitudes in regard to safety regardless of their position in the production process.

REFERENCES