Training Module “Safety Culture” for TAEK/DNS newcomers

Structure and content

1 Culture

- Organisational Culture
- Model from Schein, lily-pond-model

Artefacts and behavior:
- observable, things you can touch and see: dress codes, physical layout of work spaces

Values and Norms:
- not directly observable: ethical codes, conscious

Assumptions and beliefs
- Not visible, things taken for granted, out of awareness

For explanation:

THREE LEVELS OF CULTURE

I. ARTIFACTS
We can also characterize culture as consisting of three levels (Schein 1988). The most visible level is behavior and artifacts. This is the observable level of culture, and consists of behavior patterns and outward manifestations of culture: perquisites provided to executives, dress codes, level of technology utilized (and where it is utilized), and the physical layout of work spaces. All may be visible indicators of culture, but difficult to interpret. Artifacts and behavior also may tell us what a group is doing, but not why.

II. VALUES
At the next level of culture are values. Values underlie and to a large extent determine behavior, but they are not directly observable, as behaviors are. There may be a difference between stated and operating values. People will attribute their behavior to stated values.

III. ASSUMPTIONS AND BELIEFS
To really understand culture, we have to get to the deepest level, the level of assumptions and beliefs. Schein contends that underlying assumptions grow out of values, until they become taken for granted and drop out of awareness. As the definition above states, and as the cartoon illustrates, people may be unaware of or unable to articulate the beliefs and assumptions forming their deepest level of culture.

A metaphor for the structure of culture that I’ve found helpful is that of the Lily Pond (see Figure 1).

On the surface of the pond, clearly visible are many lily pads and their characteristic blossoms. Some are in full bloom, some are just buds, and others are dead or dying, i.e. no longer healthy. Under the surface and less visible are the stems. Depending on the light conditions and the clarity of the water, they will be easier or more difficult to see. At the bottom of the pond is the muck, generally not visible from the surface, but this is what feeds and nourishes the pads and flowers, through the roots and stems. Similarly, in an organization culture, those elements which are more visible, observable, and concrete are on the surface; values, ideals, and operating principles that are consciously held but more abstract are the connectors and conduits; and that which is both part of and feeds the system is on the bottom, operating in both implicit and abstract ways to determine behavior.

Figure 1: The Lily Pond Model of Culture
In an organization context, the lower levels of this model account for and help explain the levels above them (Schein, 2004; Scorzoni, 1982).

Because this is both a system and a structure, it’s important to pay attention to all three levels and the specific relationships among them.

Different organizations may have similar espoused values that are manifested or get acted out in different ways, or conversely, behaviors and norms that appear to be similar but occur for very different reasons or are the result of divergent values and beliefs. No two organizations are alike, and even parts of large organizations that share a common core culture may vary at the level of specifics or emphasis.

REFERENCES:
Taken from https://de.scribd.com/document/98841641/Three-Levels-of-Culture

2 Nuclear safety

Considering the possible consequences of an accident in a Nuclear Power, nuclear safety has to be of overriding priority. This is valid for all interested parties.

There are 3 components to be considered to gain high level of safety: Technology, organisation and people. The technology has been developed to a very high safety standard, but this cannot compensate the two other factors. Therefor organisation and people have to be promoted as well to maintain and improve safety.

Most known nuclear catastrophes resulted from a combination of technical failure and organisational/human failure.

Examples:
Tchernobyl, Tokai Mura, Fukushima, Davis Besse
Non-nuclear catastrophes as examples also possible: Titanic, Challenger, …

But even accidents without catastrophic consequences may discredit nuclear power and lead to undesired consequences:
Longterm shutdown
Loss of public trust (even for the regulatory body)
3 Safety Culture

Definition IAEA (Safety Series No 75-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"

Aspects of Safety Culture (Organisation – Management – Individual)
(From IAEA INSAG-15)

Relationship of Safety culture – safety management – individuals
(From HSK, now ENSI)
Culture definition (simplyfied):

“Culture is how we do things around here”
“Culture is how we act, if the boss is not around”
“Culture is how we act, if nobody is watching”
→
“(Safety) Culture is how we do things around here (related to safety issues)”
“(Safety) Culture is how we act (related to safety issues), if the boss is not around”
“(Safety) Culture is how we act (related to safety issues), if nobody is watching”

4 Risk perception
Example: (Seat belt in plane “Please remain seated and keep your seatbelts fastened until the aircraft has reached the final parking position and the safety belt signs have been switched off”)  
• The risk is underestimated, because it causes “normally” no consequences.
• Deviations become normal
• Drifting into errors/events/incidents/accidents

5 How standards (of behavior) evolve

<table>
<thead>
<tr>
<th>Good (strengthening factors)</th>
<th>Bad (weakening factors)</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Communication of expectations: “In this area, the wearing of hard hats is mandatory”</td>
<td>• Vague expectations: “In this area, it is better to wear hard hats”</td>
</tr>
<tr>
<td>• Provision of resources (good hats are provided)</td>
<td>• Inadequate provision of resources (hard hats are too small and uncomfortable)</td>
</tr>
<tr>
<td>• Role model effect (EVERY manager here wears a hat)</td>
<td>• Role model effect (managers wear hard hats here occasionally)</td>
</tr>
<tr>
<td>• Regular reinforcement (praise upon meeting expectations, correction upon misconduct)</td>
<td>• Little reinforcement (managers are seldom present, breaches are tolerated)</td>
</tr>
<tr>
<td>• Standard after some time: Mutual reinforcement amongst colleagues</td>
<td>• After some time: Whoever wears a hat is laughed at by the others…</td>
</tr>
</tbody>
</table>

6 Central messages to the individual

1. **Everyone is personally responsible for nuclear safety**  
   (Not about legal responsibility! Be aware, you are a part of the safety chain of nuclear safety. If you do not take your responsibility this will weaken nuclear safety. In any case your behavior has influence on nuclear safety)

2. **Performance of work is systematic, prudent and rigorous to give safety the first priority**

3. **Decision-making reflects safety first.**  
   (Personnel are systematic and rigorous in making decisions that support safe, reliable plant operation).

4. **Nuclear technology is recognized as special and unique** (because of the potential consequences).
5. **A questioning attitude is cultivated.**
   (Individuals demonstrate a questioning attitude by challenging assumptions, investigating anomalies, and considering potential adverse consequences of planned actions).

6. **Experience sharing is highly valued, and the capacity to learn from experience is well developed.**
   (There are systems implemented in collecting and sharing experience (Reports and analysis of events, incidents, near misses, and corrective and preventive measures)).

7. **Nuclear Safety undergoes constant examination**
   (regular oversight by the regulatory body strengthens safety)

7 About following rules

Message: Follow consequently the rules and procedures, but be critical!

⇒ Do not deviate from rules on your own (ignoring the rules)
⇒ Do not follow a rule despite having concerns about it
⇒ If you think a rule is incorrect or should be improved, highlight this and give the information to those who are responsible

8 Paradoxes of Safety Culture

1. **Difficulties to keep focused on safety**

<table>
<thead>
<tr>
<th>PRODUCTION</th>
<th>SAFETY</th>
</tr>
</thead>
<tbody>
<tr>
<td>Measurable Results</td>
<td>Ambiguous results</td>
</tr>
<tr>
<td>Clear Causality</td>
<td>Unclear Causality</td>
</tr>
<tr>
<td>Short term Benefits</td>
<td>Long term Benefits</td>
</tr>
<tr>
<td>Visible Success</td>
<td>Visible Failures</td>
</tr>
</tbody>
</table>

2. Nothing is more dangerous for Safety Culture than the success arising from the routine which results from a healthy Safety Culture.

3. We constantly learn that unsafe behavior is more efficient than safe behavior.

4. It needs a constant supply of energy. It is not a final destination - but an ongoing journey. When the supply of energy stops - Safety Culture degrades.

5. There is no short-term success - no big program approach
9 Evolvement of accidents (Reason)

"active" failures + “latent” failures → Accidents

Each barrier reduces the risk of an accident, but barriers are not perfect in the real world.

So reporting of failures of a barrier and providing measures to amend these failures will improve the function of the barrier and thus improve safety.

Event Pyramid

There are a lot more deviations than accidents. Reporting and learning from deviations (and near misses) gives us the opportunity to improve safety before accidents occur and reduces the risk of an accident.

(experience: improved "reporting culture" leads to more reports of minor events and reduced number of accidents)
10 Methods of gaining insight to the Safety Culture of the Operator

Example: Tool “Komfort”

German acronym: „Catalog for the compilation of organisational and human factors in the frame of on-site-inspections“
Developed and used by the regulatory body of Baden-Wuerttemberg

Motivation:
• Visualising safety culture to the regulatory body
• Giving feedback to the operating organization to enable improvement (what is in their own interest)
• Sensitive Area, requiring a prudent approach
• Systematical gathering and evaluation of information

Methodology:
On-site inspections by the staff of the regulatory body shall be used systematically as a source of information on safety culture without remarkable additional effort

Direct check of single aspects of safety culture on site (giving the regulatory body an own picture)

Continuous and long range collection of information for timely recognition of weaknesses and trends

Development of criteria showing good/bad safety culture in workshops
Restriction to 8 indicators:

• Quality of documents
• Compliance with regulations (obeying the rules)
• Knowledge and competencies
• Training
• Work load
• Leadership
• Cleanliness, Order (Housekeeping)
• Relationship to the regulatory body

Assessment scale

Exemplary ↔ exceeds expectations
All right ↔ matching expectations
Not all right ↔ not matching the expectations
Deviation ↔ measures necessary
The description of KOMFORT contains for each indicator

- Definition (Focus and aspects for the assessment)
- Rational and assessment tendencies
- Frequency of elicitation (10 - 40 x per NPP and year)
- Possibilities of elicitation (Hints on how to get information)
- Support for the assessment

**Support for assessment**

Example: Work load

<table>
<thead>
<tr>
<th>1. Visible work performance</th>
<th>2. Remarks of staff …</th>
</tr>
</thead>
<tbody>
<tr>
<td>exemplary</td>
<td>Overload of single persons not noticeable</td>
</tr>
<tr>
<td>all right</td>
<td>Overload of single persons limited to single cases.</td>
</tr>
<tr>
<td>not all right</td>
<td>Overload of personnel exceeds single cases</td>
</tr>
<tr>
<td>deviation</td>
<td>Widespread overload of personnel.</td>
</tr>
</tbody>
</table>

**Evaluation**

Annual evaluation
No interpretation of single cases, but trending, resp. culmination of negative assessments

- Gives hints to the regulator where to scrutinise
- Collection in an internal report
- Feedback and discussion of results with plant management
- Scheduling of measures (if appropriate)