

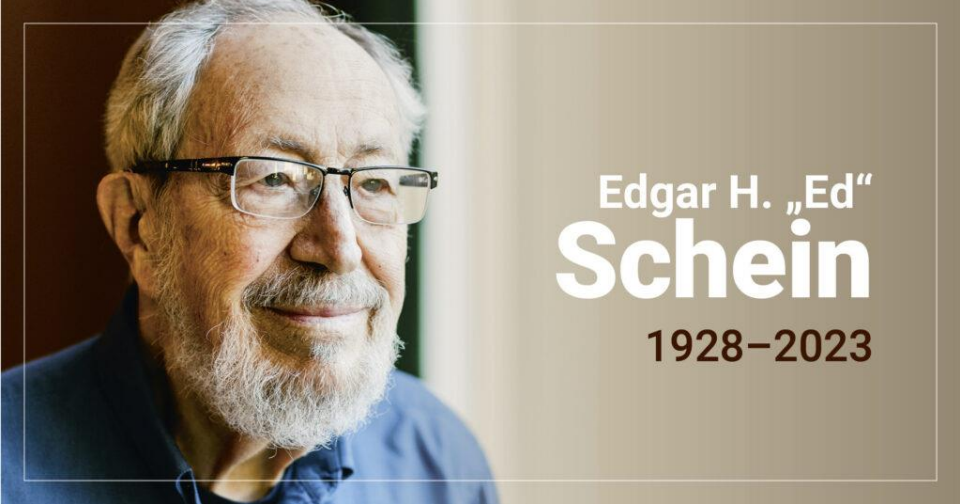
Nuclear Safety Leadership Development Program

Organizational Culture and Nuclear Safety Culture

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Organizational culture

Dr. Edgar Schein's
definition of **organizational culture**:

From “The Corporate Culture Survival Guide”:

“Wherever a group has enough common experience, a culture begins to form [...] Thus the key to understanding whether a culture exists or not is to look for common experiences and backgrounds.[...] Culture is the sum total of all the shared, taken-for-granted assumptions that a group has learned throughout its history.”

From "Organizational Culture and Leadership“:

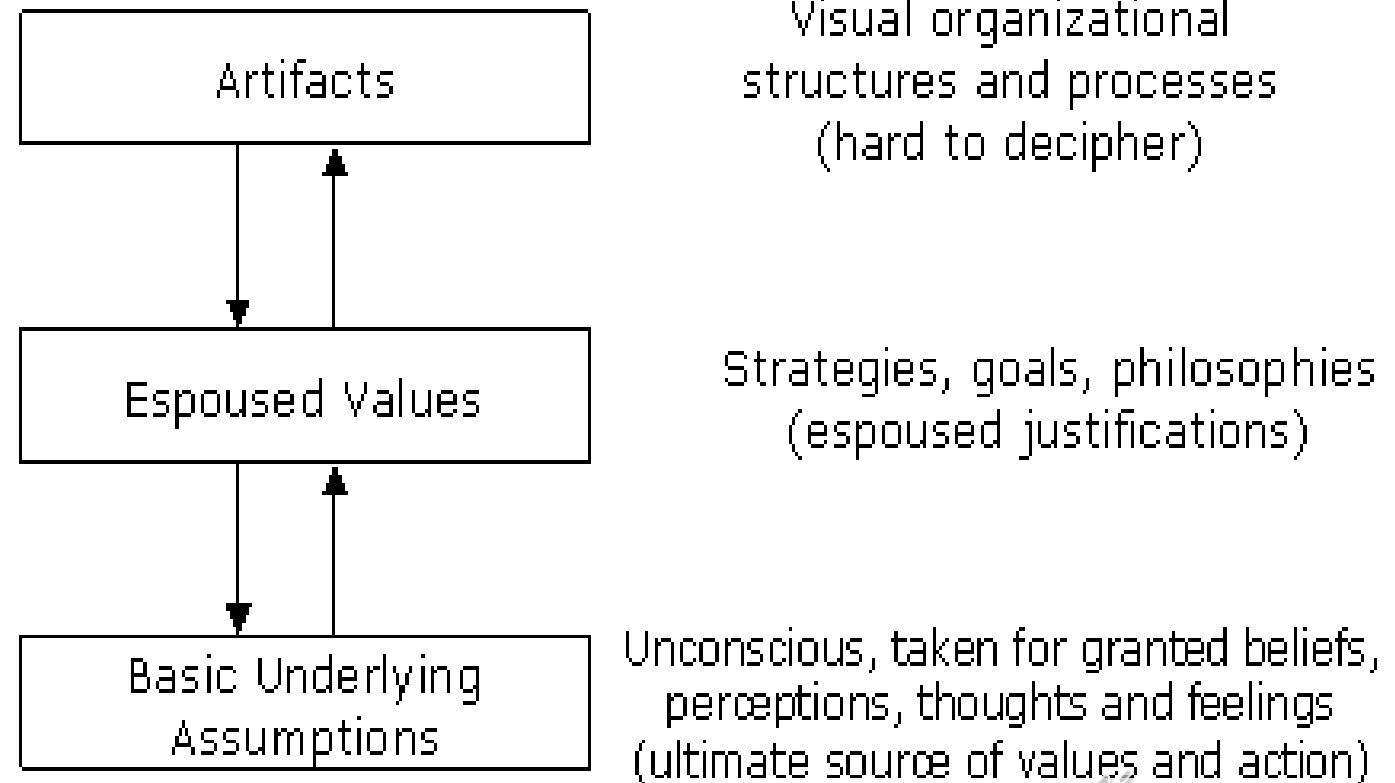
"The culture of a group can now be defined as a pattern of shared basic assumptions that was learned by a group as it solved its problems of external adaptation and internal integration, that has worked well enough to be considered valid and, therefore, to be taught to new members as the correct way to perceive, think, and feel in relation to those problems."

Organizational culture

In "Organizational Culture and Leadership", Dr. Schein presents the 3 levels of culture and explains how these influence each other:

- Artifacts, which include „all the phenomena that you would see, hear, and feel when you encounter a new group with an unfamiliar culture”; artifacts include behaviors.
- Espoused beliefs and values, which are “the articulated, publicly announced principles and values that the group claims to be trying to achieve”.
- Basic underlying assumptions, which are tacit, unconscious, taken-for-granted beliefs and values that “determine behavior, perception, thought, and feeling”.

Three Levels of Culture (Schein)

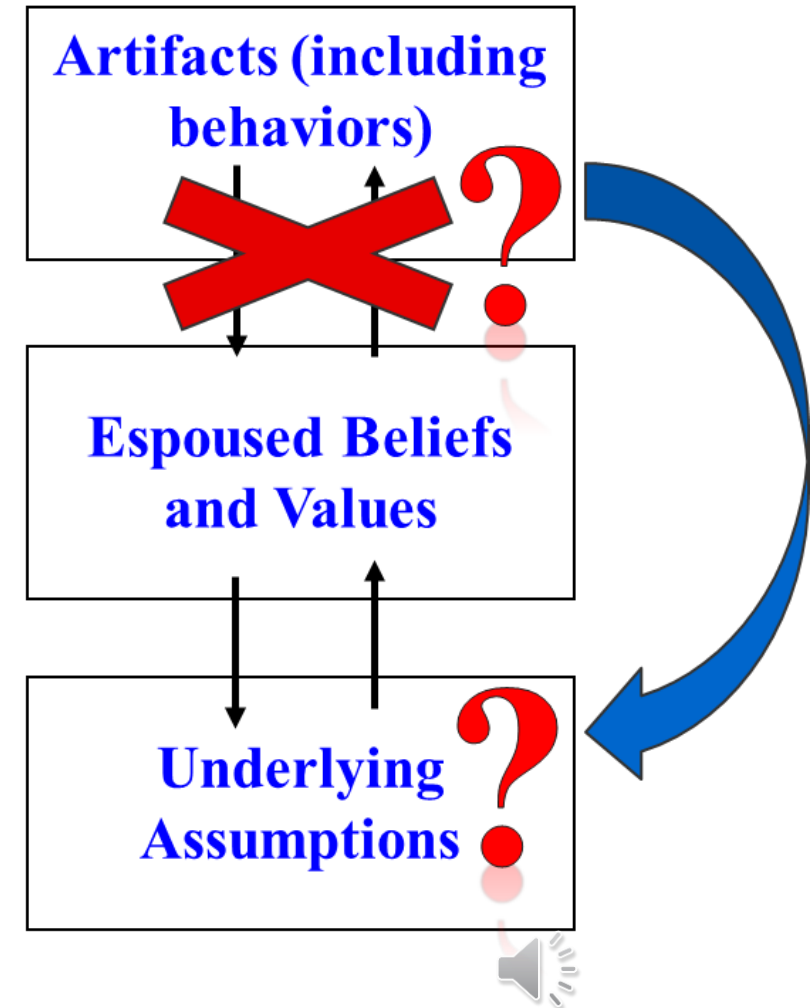


E. Schein, Organisational Culture and Leadership, 1992

Organizational culture

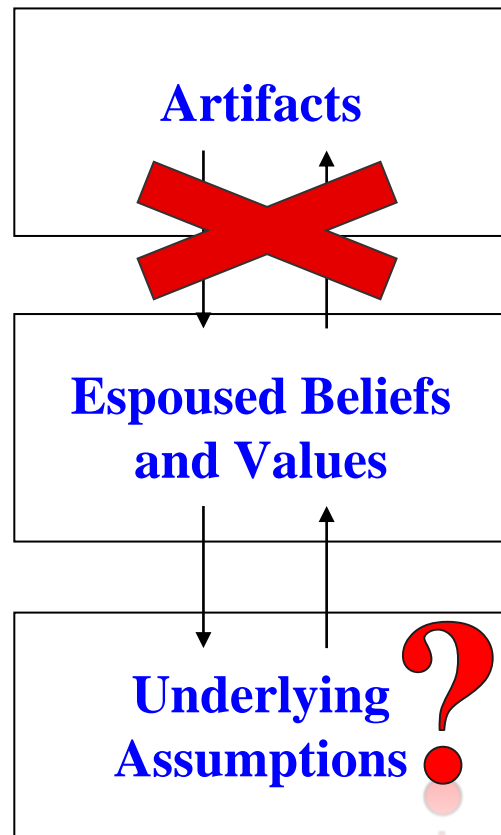
In his book “The Corporate Culture Survival Guide”, Dr. Schein advises us to investigate the basic underlying assumptions when we see misalignment between the artifacts (what we see is here, what we actually do) and the espoused beliefs and values (what we say is here, what we say we do):

“As a general principle, the way to deeper cultural level is through identifying the inconsistencies and conflicts you observe between overt behaviors, policies, rules, and practices (the artifacts) and the espoused values as formulated in vision statements, policies, and other managerial communications. You must then identify what is driving the overt behavior and other artifacts. This is where the important elements of the culture are embedded.”



Organizational culture

Edgar Schein quotes



“Culture can be described and assessed at the levels of artifacts, espoused values, and shared tacit assumptions.

*The importance of getting to the assumption level derives from the insight that unless you understand the shared tacit assumptions, you cannot explain the **discrepancies that almost always surface between espoused values and observed behavioral artifacts.** “*

“Culture matters because it is a powerful, latent and often unconscious set of forces that determine both our individual and collective behavior, ways of perceiving, thought patterns, and values.

Organizational culture in particular matters because cultural elements determine strategies, goals and models of operating.”

Nuclear safety culture

The International Atomic Energy Agency (IAEA) defines safety culture as *“the assembly of characteristics, attitudes and behaviors in individuals, organizations and institutions which establishes that, as an overriding priority, protection and safety issues receive the attention warranted by their significance.”*

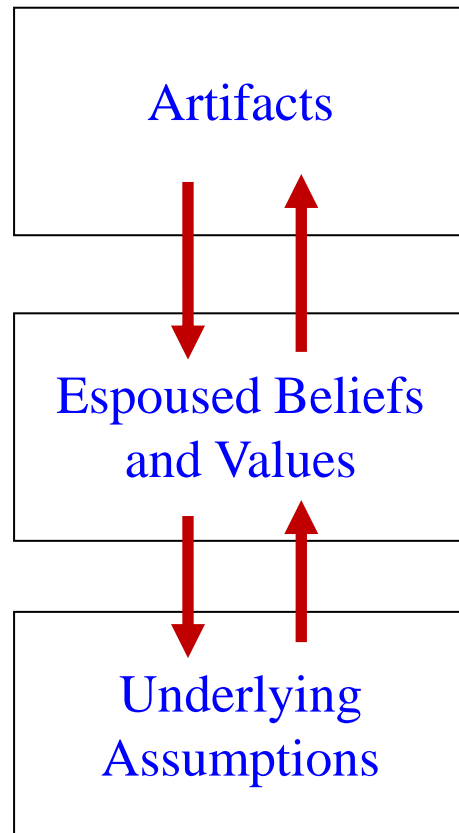
The World Association of Nuclear Operators (WANO) defines nuclear safety culture as *“the core values and behaviors resulting from a collective commitment by leaders and individuals to emphasize safety over competing goals, to ensure protection of people and the environment.”*

Using our knowledge and experience in the nuclear industry, we may try and make an inventory of specific artifacts and espoused values, with significant examples, for various areas of work and organizational groups (e.g. design, operation, work planning, maintenance, safety analyses, technical support, training, procurement, management, administrative support, emergency preparedness, independent oversight, regulatory oversight, research and development, etc.).

Nuclear safety culture

Examples in the context of a (nuclear) organization

Edgar Schein's model (a dynamic model)



Organizational structure; processes; documented management system and procedures; policy statements; use of safety climate surveys; safety improvement programs; indicators; allocation of resources; documents produced; emergency drills; training facilities; maintenance facilities; mock-ups; outsourced activities; apparel; logos; warning signs; work practices; personnel behavior; reporting procedures; use of OPEX; succession planning; incentives and rewards; use of peer reviews, etc.

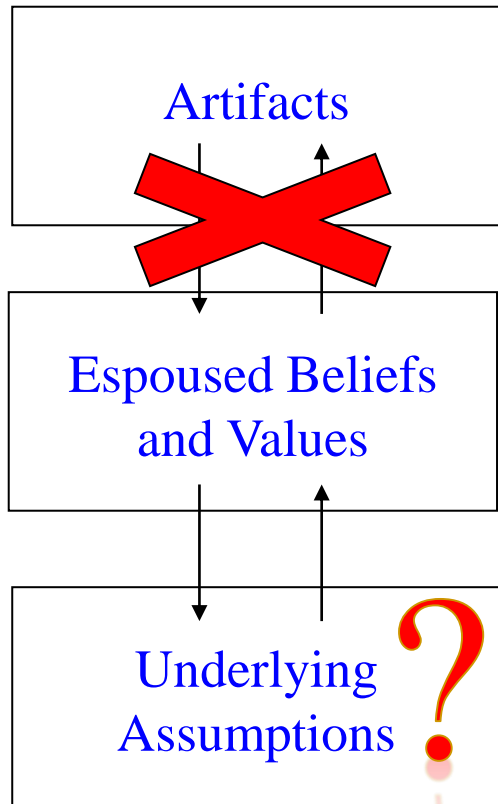
– all things visible

Safety is our first priority; We have sound and transparent decision-making processes; We value competence and professionalism; We encourage reporting of abnormal conditions; We have a blame-free environment; We are a learning organization; We value teamwork, etc. – usually declared in policy statements – almost always positive declarations

Everyone is responsible for safety; Everyone can contribute to the success of the organization; We trust each other; We don't live on past successes; We can always improve; We should learn from OPEX so that we don't become case studies; We don't tolerate substandard performance; We can report problems without fear of repercussions, etc. – assumptions shared

Nuclear safety culture

Edgar Schein's model



Dr. Schein recommends that we investigate the “underlying assumptions” (basic assumptions) only when we see a misalignment between the artifacts (*what we see is here, what we actually do*) and the espoused beliefs and values (*what we say is here, what we say we do*).

The basic / underlying assumptions may support or may undermine safety culture.

We should identify the assumptions that support safety culture and cultivate them.

We should identify the assumptions that undermine safety culture and we should discourage them.

In my view, basic assumptions are (like) root causes and can be treated as such. Apparently unrelated artifacts, including significant events, may have their root causes in shared basic assumptions. If we think of some of the most significant accidents and near-misses in the history of the nuclear industry, we often find shared basic assumptions about various scenarios not having been considered credible before they actually occurred.

Nuclear safety culture

Some examples of positive basic assumptions include beliefs like: My work is important for nuclear safety; Sub-standard performance in my work may have a negative impact on nuclear safety; I see something, I say something (I report any concern I have); Peer-checks help me because they reduce the chance of errors; If I have a question, I better ask it to get clarification rather than make a wrong assumption; Unverified assumptions need to be questioned; We must prepare for the unexpected; Safety and production go hand in hand; etc.

Negative examples of basic assumptions may include wrong beliefs such as: ~~It's ok because we've always done things this way; We should tell management what we think they like to hear; We never had a serious event, so an accident cannot happen here; We're safe because the regulator gave us the license; There's no point in reporting problems because they don't get fixed; If I teach others to do what I do, I may become redundant; If the regulators or peer reviewers did not find anything, then we don't have any problems.~~

Nuclear safety culture

Whenever we detect signs of declining performance, we should investigate the causes for the discrepancies between what we see out there (artifacts) and what we declared and promised (espoused values).

We should determine whether it is a problem of resources (including expertise), or a problem of basic assumptions, beliefs, impressions, and feelings, or if both tangible aspects and cultural elements contribute (as it is often the case).

Artifacts do influence the basic assumptions. What is the current state of affairs with regard to material and financial resources, training and qualification programs and facilities, procedures, exercises and drills, material condition and plant housekeeping, availability of sufficient in-house technical expertise (and many other tangible, quantifiable aspects) will influence the basic assumptions about what is acceptable, tolerable, desirable, expected; the influence of the artefacts is more pronounced than the influence of the espoused values declared in policy documents and presented in posters.

In cases where cultural basic assumptions are found to determine behaviors more than the formal processes of the organization, it means that the processes and procedures have not been effective; efforts need to be made both to fix processes and to change culture.

Nuclear safety culture

Improved processes and supplementary resources allocated by the leaders do not immediately or necessarily fix culture and culture does not necessarily bring in additional resources, but there is a feedback relation between resources and culture, between the artifacts and the basic assumptions.

A healthy safety culture and the positive assumptions supporting such a culture cannot develop and thrive in organizations struggling with resource problems (insufficient funding, insufficient qualified staff, lack of expertise) and poorly defined processes and responsibilities.

At the same time, a poor safety culture will inevitably cause problems that will cost an organization resources (including money, time).

Organizations performing in accordance with excellence standards require and have additional resources and more effective processes in comparison with organizations performing in the survival mode.

So, when observing signs of trouble, we should investigate whether it is culture or it is something else that affects organizational performance. We can only know if we investigate, and the corrective actions may consist of more than just additional training and procedures.



Nuclear safety culture

Although we speak of organizational culture as covering all elements of culture of an organization, we should note that the elements relating to nuclear safety, in the context of a nuclear organization, cannot be fully separated or isolated from the other cultural elements and influences.

Although nuclear safety culture is the term we have commonly used in more than 30 years, there have been attempts to promote other terminology, that would be more accurate, such as “a culture that supports nuclear safety” or “a culture of safety”.

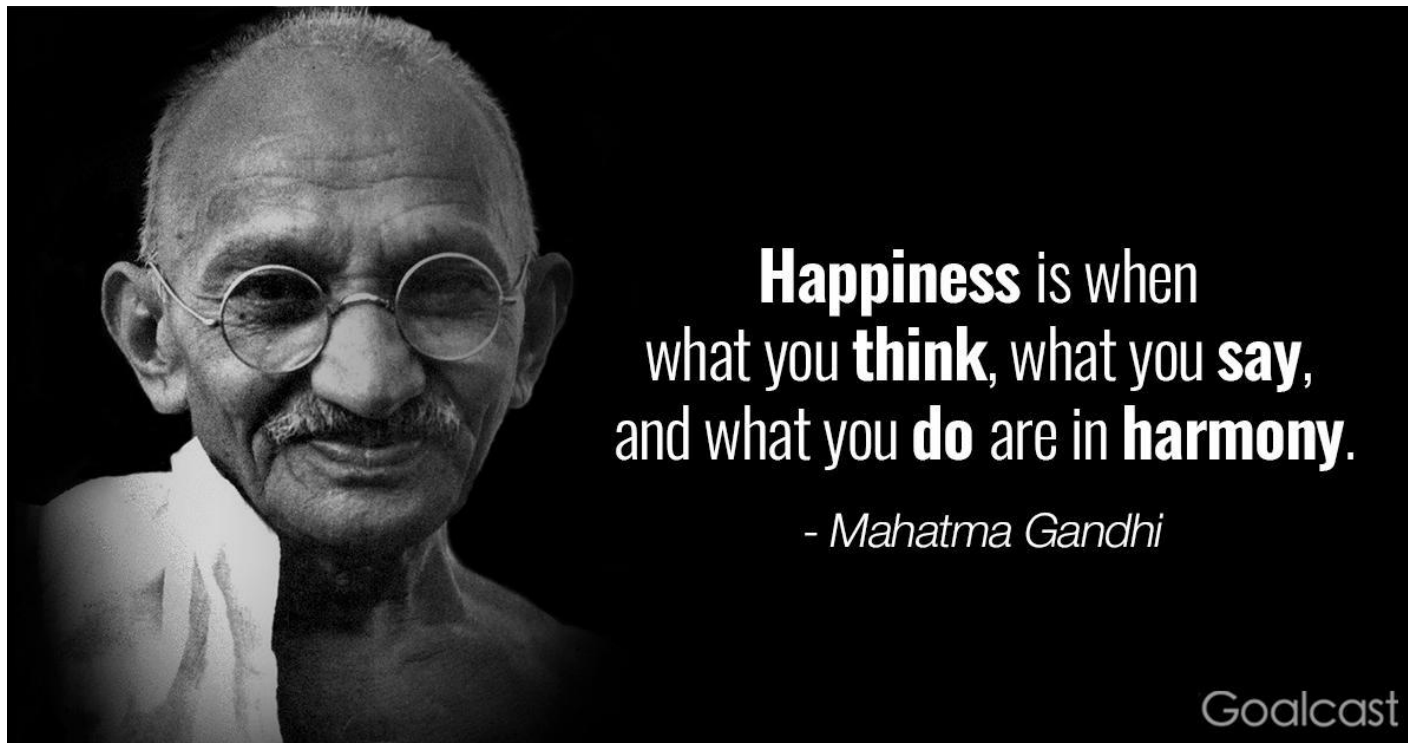
Semantics and social psychology aside, I prefer to refer to nuclear safety culture, because my focus is on the elements (artifacts, espoused values and basic assumptions) that have an impact on nuclear safety. However, in these elements of nuclear safety culture, I include the shared basic assumptions that at origin have nothing to do with nuclear but which influence attitudes and behaviors relevant for nuclear activities.



Nuclear safety culture

We constantly try to adapt to the organizational culture but we also continuously try to adapt the organization to ourselves.

The discrepancies between artifacts and espoused values come from our acting in accordance with basic assumptions rather than with formal rules and procedures; these discrepancies also influence our basic assumptions, in a feedback loop.



Discrepancies between what we think (our basic assumptions) and what we say (the espoused values we declare) may reveal themselves in what we do (the artifacts).



What we can see and hear

- *We see artifacts.*
- *We are aware of the espoused values and principles* (these are usually set in the policies, goals and strategies).
- *We may discover / hear some of the basic assumptions* in the discussions (including interviews) with the personnel and in the root cause analysis reports for events.
- *We shall try and uncover the basic assumptions*, because they may be the root causes for many apparently unrelated events.



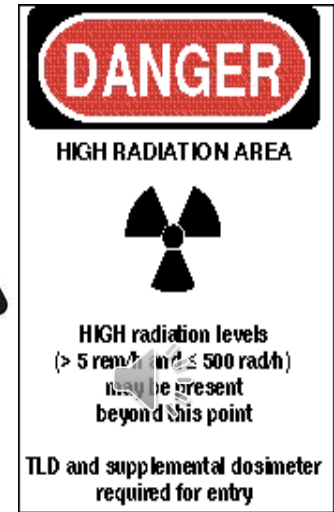
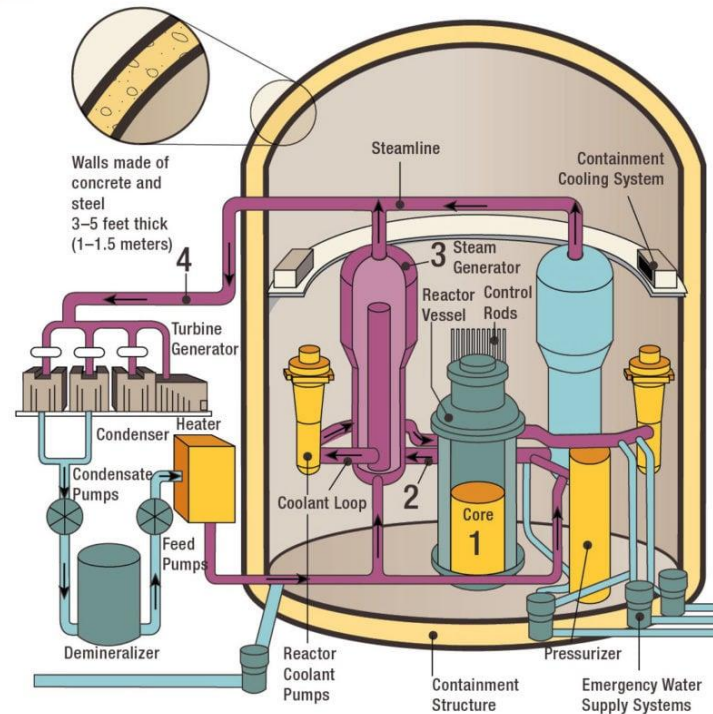


Artifacts



Typical Pressurized-Water Reactor

Nuclear safety culture



What we can do

- We *set requirements on some of the artifacts* or *directly influence some of the artifacts*.
- We review and inspect the artifacts (procedures, processes, practices, programs, behaviors, state of structures, systems and components, organizational changes, resources, etc.) and take actions in cases of non-compliance with requirements.
- We may observe patterns, including improvement in performance or signs of declining safety performance.
- We *may influence the espoused values and principles* when we elaborate and review policies, goals and strategies.
- We may discover underlying/basic assumptions or may seek to discover them if we observe discrepancies between espoused values and artifacts; we *can influence some basic assumptions*.



What each of us should do

- Practice what we preach. No double talk and no double standards
- Respect the legislation, regulations, license conditions and align to the best international standards, guidelines and practices
- Make the standards clear, through procedures, training and give personal example
- Continuously question underlying/basic assumptions when we observe discrepancies between espoused values and artifacts
- Investigate why discrepancies between espoused values and artifacts appear, why there are differences between the standards and the actual performance
- Don't be overly and overtly defensive and don't argue about the findings resulting from the reviews and inspections (regardless whether they are performed by regulators, by peers, by independent oversight or by the audit group); they reveal some discrepancies and it is in our best interest to investigate and resolve them
- Devise proper corrective actions and improvement actions to ensure standards are understood and followed
- In nuclear organizations, nuclear safety shall be the first priority in all decision-making and nuclear professionals shall set the standards and drive performance improvement. Our basic assumptions should ideally be aligned with the espoused values.
- If the expected behaviors that support nuclear safety, as set in the standards promoted by IAEA and WANO are widely known, understood and consistently practiced, in all organizations in the nuclear industry, by all individuals and groups, including the managements/leadership ranks and the regulators, then we can reasonably expect to develop and maintain a strong and healthy nuclear safety culture.

Find gaps between the standards and the actual performance.

Nuclear safety culture

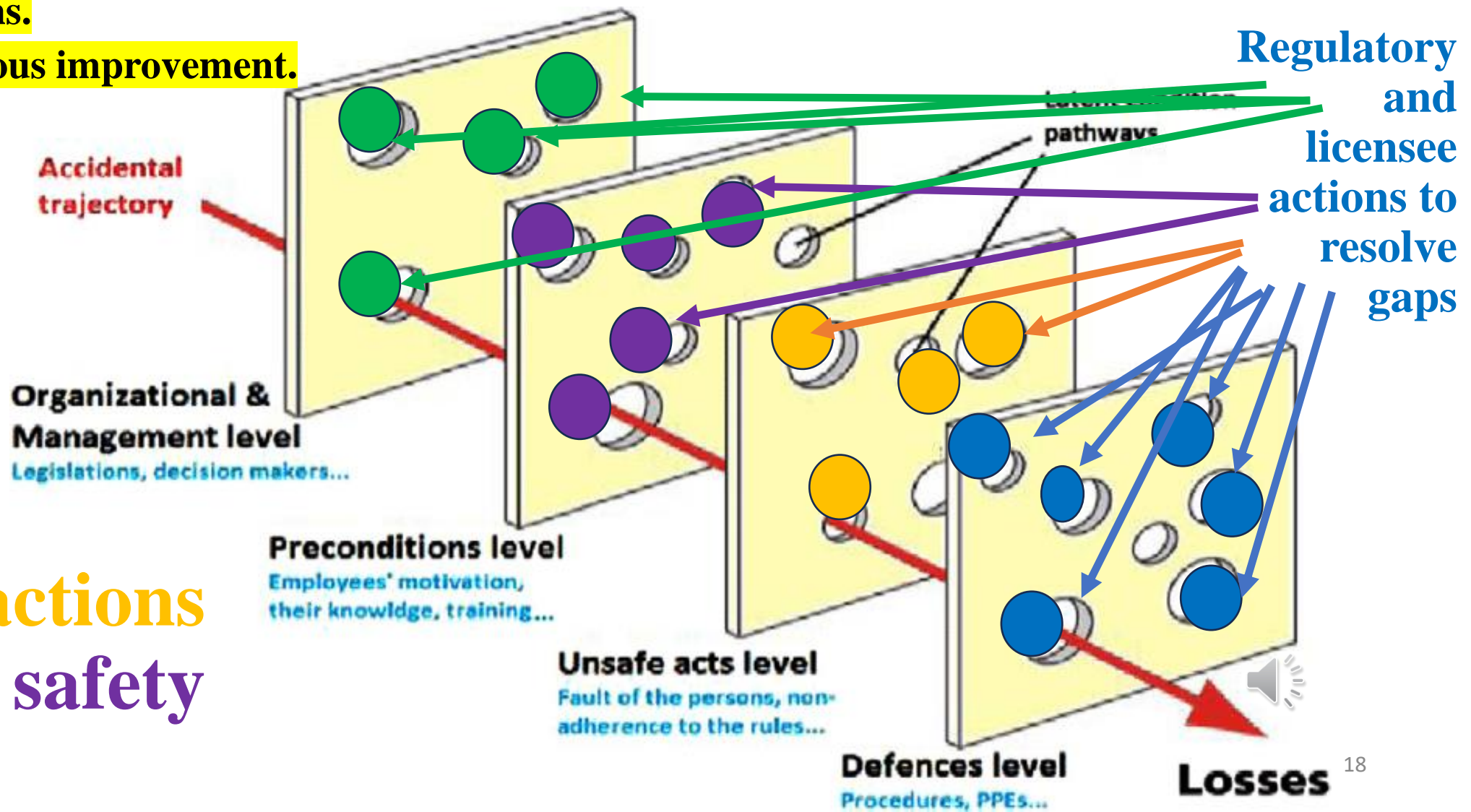
Investigate the causes for the gaps and challenge assumptions. Reinforce the standards.

Model the right behaviors. Give a personal example. Provide resources.

Resolve the gaps. Push for corrective actions that eliminate or minimize latent failures.

Follow-up on actions.

Commit to continuous improvement.



Our actions improve safety

Organizational culture and nuclear safety culture

Recommended reading

- Edgard Schein, Organizational Culture and Leadership, 4th Edition, 2010
- Edgar Schein, Corporate Culture Survival Guide, 3rd Edition, 2019
- Traits of a Healthy Nuclear Safety Culture, WANO, 2013
<https://www.wano.info/resources/traits-of-a-healthy-nuclear-safety-culture>
- A Harmonized Safety Culture Model, IAEA, 2020
https://www.iaea.org/sites/default/files/20/05/harmonization_05_05_2020-final_002.pdf



Organizational culture and nuclear safety culture

Recommended topics for reflection

- What are the artifacts of my organization that are specific to the nuclear industry?
- What are the artifacts of my organization that reflect national culture?
- What are the espoused values and principles declared in the mission and vision statements, policy documents and codes of conduct of my organization?
- Are there any inconsistencies or discrepancies between the artifacts and the espoused values? If there are, try and find out why. Are the discrepancies related to culture (basic assumptions) or to resources (including financial resources, personnel resources and expertise) or to both?
- What are the basic assumptions behind technical requirements such as compliance with regulations, license conditions and procedures? Are these assumptions known and shared by the majority of the personnel working in the organization?
- What are the basic requirements that support installation, testing and maintenance of safety related systems which have only the role in accident management and emergency response? Are these assumptions known and shared?
- What are the basic assumptions about the authority, responsibility and accountability of managers? Are these assumptions shared?
- What are the basic assumptions about the necessary competence of managers? Are these assumptions shared?
- What are the basic assumptions about what are the leadership attributes necessary in a nuclear organization?