COMPRENDIUM

IAEA Workshop for Senior Managers on Leadership and Culture for Safety

Location: MOE100, M-Building, IAEA Headquarters, Vienna, Austria
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Introduction to Workshop

The International Atomic Energy Agency (IAEA) is continuing, through this workshop, its efforts to disseminate knowledge about how safety performance can be improved through culture, leadership and management for safety. The primary objective of the workshop is to provide an international forum for you as a senior manager to share your experience and learn more about how safety culture and leadership can be continuously improved. Through this, the workshop also aims to reinforce your understanding of your own role in influencing safety culture and leadership for safety across all levels of your organization.

To ensure the practical value of the workshop, efforts will be made to tie the course content back to the every-day life of the participants. **In order to succeed in this, we ask each of you to prepare the following in advance of the workshop:**

*Please prepare to share the three key safety challenges you face as a senior manager in your organization.*

Throughout the workshop, the facilitators will go back to the challenges faced by you and work interactively with the group to find solutions to these through the continuous improvement of safety culture and leadership for safety.

Efforts will be made to achieve a productive balance between presentations and dialogues, making room for interactive sessions triggering participants to get involved and communicate experiences, feelings, thoughts and ideas. The goal is for you to leave with two things in mind: “this has provided new insights and perspectives” and “I know how to apply these new insights and perspectives in my organization”.

Below you find an introduction to the main facilitators of the workshop, the IAEA’s Normative Framework for Safety Culture and three selected articles introducing the main ideas behind the workshop.

Looking forward to meeting you in Vienna,

**Monica Haage and the facilitator team**
Workshop Facilitators

Liv Cardell, CEO and Founder, Cardell Consulting AB, Sweden

Liv Cardell has worked with all kinds of issues concerning the connection of humans and organizations for 30 years. The past 15 years, she has become increasingly interested in organizational culture and how to move a culture, and to have an impact on concepts, values, learning and continuous improvement in practice. This is often intentions that stay as harmless voluntary approaches in policy programs but rarely are lived in everyday life.

Liv is occupied with the strengthening of the cultural and humanistic notions in the workplace and with creating conditions for the development of values, personal growth and responsibility, alongside the output for everyday life. Liv has a degree in sociology, social methods, organizational psychology and mental training. During her career she studied and trained Systemic Management in Sweden with Anders Risling, in England with Peter Lang and in Denmark at Sunderland University with Carsten Hornstrup. She was also trained in coaching at the CTI Centre, and has a UGL license for training groups and leaders.

What has made the biggest impression on Liv is that she has developed her own concepts inspired by the practical experience she has gained during thirty years of working successfully with the observations of phenomena in organizations. She has worked in an extensive amount of sectors and at all levels, including in the nuclear and energy industry.

Since it is important for Liv to always have a reflective approach and to focus on continuous improvement, these experiences have been her best schooling regarding what works and does not work in organizations.

Over the years, she has built models of structures and cultures while being inspired by research that matches her values: Peter Senge, Systemic Approach, USA; Paul Moxnes, Working Environment and Anxiety, Norway; Willy Schutz, Interpersonal Behavior, USA; David Cooperrider, Appreciative Inquiry, USA; Björn Ekelund, Diversity Icebreaker, USA; Carsten Arnfjord Thomsen, innovation, research, Denmark; Jody Hoffer Gittel, Relational Coordination, USA. They all are important for the way she works and thinks.

She has almost never observed that value driven leadership, continuous improvements and learning organizations work in practice, although the desire for these concepts has been expressed in the operations policy statements for decades. That was what got her to write a
practical book on the subject of corporate culture, value management and sustainable growing.

A pillar of the book’s philosophy is to be a vitalized organization, so it is more about changing the context than to change people’s behavior. As a consultant, Liv gets very little time at her disposal to explain and implement abstract concepts such as culture and values. Therefore, she has developed simple theoretical models and tools that are easy to understand and apply in the reader’s own organizations.

An important part of cultural development is to have defined business culture concepts and a company-wide continuous scheme to develop culture.

To develop a culture is not about education but about creating structures and practice methodologies that contribute to value management, learning and continuous improvement.

Liv’s approach is appreciative, solution and future focused. Key tools and processes within the cultural evolution aims to equip the management by the renewal of cross large group dialogues across the company.

Liv Cardell’s message to the senior managers in the nuclear community:

“I wish senior managers in the nuclear community would do better at

- enabling a united management team without prestige, with shared aims and a large degree of openness. This team should have a driving licence for change and cultural management.
- disciplining attitudes and behaviours that are not accepted (means transparency, training, openness and having plans for how to measure and what to do when someone is under the accepted limit)
- changing the meeting forms so there will be more cultivating, involving, reflecting and dialogue based meetings.”
César Candás, Senior Consultant NPP Operation, Spain

Mining engineer degree from the University of Oviedo (Spain) with a specialization in nuclear energy (1983). Reactor operator license of Santa María de Garoña Nuclear Power Plant granted by the Spanish nuclear authority (1989). 32 years of experience in operation of Boiling and Pressure Water Reactors; held leadership positions at three different Nuclear Power Plants in Spain.

Since 2012, César is a Senior Consultant in Nuclear Power Plants Operation. For the IAEA, among other tasks, he consulted in the preparation of the IAEA technical document “Leadership, Human Performance and Internal Communication in Nuclear Accidents” and was an Advisor to the IAEA on “Knowledge Acquisition, Sharing and Transfer through Communities of Practice for Operating Nuclear Facilities”.

César was Plant Manager at Ascó Nuclear Power Plant (Ascó-Spain) from April 2008 to May 2012. He was appointed Plant Manager of Asco NPP after the Radioactive Particles Release Ines 2 event at Ascó I. He was responsible for the definition, development and implementation of the action plan to respond to the causes of that event. A plan for the cultural change of the organization was included. Previously, César was plant manager at Vandellós Nuclear Power Plant (Spain) (July 2005 to April 2008), he was appointed plant manager of Vandellós II NPP after the Essential Services Water System Pipe Break Ines 2 event at that plant. He was responsible for the implementation of the action plan to correct the causes of that event.

César started his career as a nuclear professional at Santa María de Garoña Nuclear Power Plant (Spain) in 1984, where we held various positions related to the operation of Santa María de Garoña NPP and participated in several courses, seminars and conferences related to safety culture and human factors. From January 2003 to July 2005, he was Plant Manager of Santa María de Garoña NPP, and was involved in numerous projects related to safety management such as the 2003 Santa Maria de Garoña Safety Culture Improvement Plan, the development of the integrated safety management guide of the Spanish nuclear industry and being lecturer of the IAEA Workshop on Proactive Safety Management held in Slovenia. Member of the independent experts group who was appointed to identify the causes and to recommend corrective actions to cope with the Essential Services Water event of Vandellos II NPP.
Nasir Afghan, Director, IBA Karachi, Pakistan

PhD in Managerial Effectiveness from the University of Twente, Netherlands.

MBA degree in Industrialization and Strategic Management from the University of Maastricht, Netherlands.

Dr Nasir Afghan is director of the MBA program at IBA Karachi, Pakistan’s premier business school. Before joining IBA he was assistant professor at Lahore University of Management Sciences (LUMS), a very prestigious university in South Asia. He is also a visiting professor at FH Joanneum University of Applied Sciences Graz, Austria. Before completing his MBA, Nasir worked for several years for a Fortune 500 Oil exploration firm in Singapore. As Management Consultant he has performed a number of consulting projects on Human Resources Development and Leadership Development in organizations. He has presented papers at several conferences including the Asia Academy of Management conference and the Transformational leadership conference, and the European Academy of Management. His present research interest is in the area of Transformation Leadership and Leadership Development. He conducted several executive education programs as program director mostly in HRM, Team Building, Organizational Restructuring and Leadership Development at LUMS. He has been conducting training and coaching programs for PNRA, IAEA, Dubai Siemens and Dubai ABN-AMRO and most of the Pakistani large business organizations. He has been serving as Director and Board member of several profit and non-profit organizations in Pakistan. Currently he is serving as Leadership Development Consultant for International Atomic Energy Agency (IAEA) Vienna, Austria.
Martin Egerth, Product Manager, Human Factors Training / Psychologist, Lufthansa Flight Training GmbH

Martin Egerth is a Product Manager, Human Factors Training at Lufthansa Flight Training. As a psychologist and senior human factors expert, he manages Lufthansa’s entire portfolio of human factors and security trainings for the aviation industry and also for external industries.

During his eleven years at Lufthansa, Martin has developed, overseen and conducted trainings that have developed the skill sets of pilots, flights attendants and non-flying staff. From basic trainings, to recurrent trainings to management trainings for Lufthansa and external airlines, he has trained over 8,000 flying staff.

Martin has also founded a human factors working group comprised of 27 European and international airlines that meets annually to exchange CRM best practices, discuss how to avoid incidents and accidents, identify the influence that culture and safety culture has on CRM and develop CRM for the future.

Martin holds a Master’s Degree in Psychology from the University of Innsbruck and is currently pursuing his doctorate.

Martin Egerth’s message to the senior managers in the nuclear community:
“The last few years have been the safest in the history of civil aviation. Despite this fact, the industry cannot become complacent and assume this trend will continue. Unfortunately, we have seen that even with legal requirements for trainings and safety management systems in place, new and improved safety barriers, automation and fatigue risk management systems, incidents and accidents still occur.

The nuclear industry and the aviation industry have many things in common. For both, safety should be priority number one. To achieve a safety goal of 10^-8, one needs to understand safety, have a functioning safety/organizational culture and invest time (and money) in training. In addition, risk management, leadership, reporting systems as well as personnel selection and assessment play a pivotal role in achieving safety in the aviation industry. The question is, what is your safety goal and what is being done to achieve it. My speech will stress that human factors trainings must not only continue to develop in terms of subject matter and training methods, but continue to be an integral part of the nuclear industry strategy regardless of how safe current operations are. I hope to present some new ideas and discuss how to improve safety, leadership and culture.”
Monica Haage, Safety Officer (Culture, Leadership & Management for Safety), IAEA

Monica Haage is an international safety culture specialist at the IAEA. Her areas of expertise include HOF, Leadership and Management for Safety, Systemic Approach to Safety, and HTO. One of her key contributions is the development and application of the new IAEA safety culture assessment methodology and the IAEA Safety Culture Continuous Improvement Process (SCCIP), a systematic process to support Member States in implementing a safety culture continuous improvement programme. Ms Haage was the IAEA technical lead for the human and organizational and safety culture section in the IAEA Fukushima Daiichi Accident Report.

Monica holds degrees in Engineering (Automation) and Social Psychology (Leadership and Organizational Theory). Before joining the IAEA in 2009, she held positions as international EHS manager at ISS, and safety culture and HTO expert at Oskarshamn Nuclear Power Plant. Her career started at the Scandinavian Airlines where she held various positions.

The topic of the workshop has been central throughout Monica’s career. She has worked as a leader and has also worked with senior managers to improve companies’ safety culture. Her experience from both the aviation and nuclear industries is that leaders do not usually fully comprehend the role they have in influencing safety culture.

Monica Haage’s message to the senior managers in the nuclear community:
“I wish that regulatory bodies’ and licensees’ senior managers take times to reflect and learn about the lessons learnt from Fukushima related to human and organizational factors and think about how these lessons are related to their role and their organization. When realizing where the gaps are they need to take firm actions systematically to continuously improve. This includes investing resources in becoming proactive to be able to catch weak signals of decline in safety. Unfortunately, the areas of human and organizational factors, culture and leadership are often perceived to be fuzzy and difficult to influence. However, those that have understood and experienced the many positive synergies generated from a strong safety culture are convinced. I wish that all senior managers in the nuclear community will experience this in their daily work to keep up the needed progression in the enhancement of defence in depth.”
## Agenda* for Training Workshop on Leadership and Safety Culture for Senior Managers

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<tr>
<td><strong>Theme</strong></td>
<td>The Learning Journey</td>
<td>Safety Culture in Theory and Practise</td>
<td>Systemic Approach to Safety</td>
<td>Bringing the Learning Journey Home</td>
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<td><strong>08:00</strong></td>
<td>Registration at Gate 1</td>
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<td>Opening of Workshop</td>
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<td>Monica Haage, scientific secretary, IAEA</td>
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<td><strong>Introduction</strong></td>
<td>Liv Cardell</td>
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<td>Monica Haage</td>
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<td><strong>Story telling: A Story From the Field</strong></td>
<td>Presentation: Culture</td>
<td>Exercise: Systemic Mapping 1 – Organizational Issues and Problems</td>
<td>Presentation &amp; Dialogue: The Role of Leaders in Safety</td>
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<td>Monica Haage</td>
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<td><strong>12:00</strong></td>
<td>LUNCH</td>
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<td>Tangible outcomes: What to do differently in your own organization Liv Cardell</td>
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<td><strong>13:00</strong></td>
<td>Reflection: What to bring back to your organization - Learning Journey Groups TBC</td>
<td>Presentation &amp; Dialogue: Tools for Improving Safety</td>
<td>Exercise: Systemic Mapping 2 – Proactive Solutions All Facilitators</td>
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<td>Presentation &amp; Exercise: Shared Space</td>
<td>Dialogue: Reflection how could these tools improve safety performance?</td>
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<td>Monica Haage</td>
<td>Liv Cardell &amp; César Candás</td>
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<td>Presentation &amp; Dialogue: Leadership for Safety César Candás Nasir Afghan</td>
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<td><strong>15:30</strong></td>
<td>Presentation: Management for safety – The Integrated Management System as the Ultimate Organizational Steering Tool Monica Haage</td>
<td>Presentation &amp; Dialogue: Safety Goal a safety goal of 10-8: The importance of training, leadership and culture in a functioning safety culture Martin Egerth</td>
<td>Presentation: IAEA’s Approach to Safety Culture Continuous Improvement Monica Haage</td>
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<td>Dialogue: Organizational Issues and Problems</td>
<td>Dialogue: Safety Culture Continuous Improvement – How to do this in practise</td>
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*Please be aware that the facilitators will adapt the agenda to the learning process and might not strictly follow the above structure.
IAEA Normative Safety Culture Framework

Characteristic 1: Safety is a clearly recognized value

Attributes

1) The high priority given to safety is shown in documentation, communications and decision making:
   a. The safety policy should be documented and should be communicated to personnel.
   b. The rationale for significant decisions relating to safety should be communicated regularly to personnel.
   c. Decisions that affect safety should be made in a timely manner.
   d. Multiple methods should be used to communicate the importance of safety throughout the organization.
   e. Key decisions relating to safety should be periodically revisited and assumptions and conclusions should be challenged in the light of new information, operating experience or changes in circumstances.

2) Safety is a primary consideration in the allocation of resources:
   a. Resource allocation should be in line with the stated priorities and goals, strategies, plans and objectives of the organization.

3) The strategic business importance of safety is reflected in the business plan:
   a. Goals, strategies, plans and objectives relating to safety should be clearly identified and integrated into the business plan.

4) Individuals are convinced that safety and production go hand in hand:
   a. Managers should be especially sensitive to decisions that may seem to place production or other factors above safety and should take care to explain such decisions to personnel.
   b. Managers and supervisors should regularly communicate the importance of ensuring safety while meeting requirements for production and performance.

5) A proactive and long term approach to safety issues is shown in decision making:
   a. In strategic and long range planning, account should be taken of known and potential safety issues.
b. The priorities of, and incentives for, senior management should not be concerned exclusively with short term goals, strategies, plans and objectives.

6) Safety conscious behaviour is socially accepted and supported (both formally and informally):
   a. The performance appraisal process should recognize and reward safety conscious behaviour.
   b. Peers should encourage each other to engage in safety conscious behaviour.

Characteristic 2: Leadership for safety is clear

Attributes:

7) Senior management is clearly committed to safety:
   a. Senior managers should treat supervisors as a crucial part of the management team as they translate Safety Culture into practice and should give them their full support.
   b. Senior corporate managers should periodically visit operating installations to assess at first hand the effectiveness of management.

8) Commitment to safety is evident at all levels of management:
   a. Managers should establish clear expectations of performance in areas that affect safety and these should be documented where appropriate.
   b. Managers should adhere strictly to policies and procedures in their own conduct and should not expect or accept special treatment.
   c. Managers should not tolerate or ignore substandard performance in relation to safety for any reason.
   d. Managers should exhibit a sense of urgency in remedying significant weaknesses or vulnerabilities.

9) There is visible leadership showing the involvement of management in safety related activities:
   a. Managers should be able to recognize conditions of degraded safety (physical or organizational).
   b. Managers should individually note performance and inspect conditions in the field by walking around the installation and observing and listening to individuals, and should intervene vigorously to remedy safety issues ('walk, look, listen and fix').
   c. Managers should ensure that situations adverse to safety are remedied.
   d. Supervisors should spend time observing and coaching individuals at their workplaces and should encourage and reinforce expected behaviour.
   e. Supervisors should discuss safety issues frequently with their teams or work groups.
   f. Managers should visit personnel at their workplaces.

10) Leadership skills are systematically developed:
    a. Managers and supervisors should be selected and evaluated with due consideration of their demonstrated ability to foster a strong Safety Culture.
    b. Skills in change management should be taught to individuals in leadership roles.
    c. A succession plan that includes aspects of Safety Culture should be put in place for developing future managers.

11) Management ensures that there are sufficient competent individuals:
    a. Personnel should only perform work for which they are trained and qualified.
    b. A systematic approach should be taken to training and qualification.
    c. Attendance at training by personnel should be given a high priority.
    d. Staffing levels should be consistent with the demands of ensuring safety and reliability.
12) **Management seeks the active involvement of individuals in improving safety:**
   a. Managers should actively seek dissenting views and diverse perspectives and should encourage open and frank discussion to support independent thinking.
   b. Managers should encourage the raising of concerns by personnel and should take action or else explain why no action was taken.
   c. Where practicable, managers should involve personnel in decision making and activities that affect them, for example, by involving individuals in writing their own procedures and instructions.
   d. Individuals should feel that their opinion matters and should be able to cite instances of their input leading to positive change.

13) **Safety implications are considered in change management processes:**
   a. Processes for change management and control should be put in place so that account is taken of the possible effects on safety of changes to procedures and equipment and other managed changes.
   b. Personnel should be informed of impending changes in ways that uphold trust within the organization.

14) **Management shows a continual effort to strive for openness and good communication throughout the organization:**
   a. Supervisors should respond to individuals’ questions openly and honestly and should maintain good relations with personnel.
   b. Managers should ensure that open communication is valued and preserved.
   c. Managers should visit personnel at their workplaces and, where possible, should hold open meetings to explain issues and decisions in context.
   d. Managers and others who may influence the behaviour of personnel should encourage a questioning attitude.
   e. Management has the capability to resolve conflicts as necessary.
   f. When necessary, fair and impartial methods should be used to resolve conflicts and to settle disputes.

15) **Relationships between managers and individuals are built on trust:**
   a. Managers should carry out what they undertake to do in their communications.
   b. Personnel should adhere to the management system.
   c. Managers should be able to be trusted by personnel to act professionally when personnel raise safety concerns or report near miss events.
   d. Managers should ensure that safety consciousness prevails in the working environment throughout the organization.
   e. Managers should ensure that communication is not stifled in the organization and should take prompt action to counter any such effect.

**Characteristic 3: Accountability for safety is clear**

**Attributes**

16) **An appropriate relationship with the regulatory body exists that ensures that the accountability for safety remains with the licensee:**
   a. Complete and accurate information should be provided to the regulatory body.
   b. The regulatory body should be consulted to obtain any necessary clarification of, and guidance on, regulatory matters.
   c. The licensee should be seen by the regulatory body to be open and timely in its reporting and interactions.

17) **Roles and responsibilities are clearly defined and understood:**
a. The organization is required to define and to document functions and responsibilities for all aspects of safety that are under its control,
b. Individuals should understand their functions and responsibilities for safety and how their work may affect safety.
c. Individuals should know where to obtain help with safety related issues and should seek clarification if necessary.
d. When contractors are engaged, their functions and their responsibilities for safety should normally be specified in contractual documents. The individuals affected in the organization and in the contractor organization should be made aware of these arrangements.

18) **There is a high level of compliance with regulations and procedures:**
a. Personnel should adhere to regulations and procedures and instances of non-compliance should be avoided.
b. Management’s expectations for the use of procedures (i.e. when procedures are to be in the hands of the user and are to be used) and adherence to procedures (i.e. the degree of compliance expected) should be clear and made well known to personnel.
c. Managers and supervisors should inspect workplaces frequently to ensure that procedures are being used and being followed in accordance with expectations.
d. Personnel should be encouraged to review procedures and instructions critically in use and to suggest improvements where appropriate.

19) **Management delegates responsibility with appropriate authority to enable clear accountabilities to be established:**
a. Accountable behaviour should be positively reinforced by managers and peers.
b. Individuals should help each other to fulfil their accountabilities.
c. Accountability should be perceived positively and not negatively as a way to apportion blame.
d. If possible, the accountability for every operational decision should be clear before its execution.
e. The way authority is exercised should not discourage individuals from maintaining open communication or reporting concerns or unusual observations.

20) **‘Ownership’ for safety is evident at all organizational levels and for all personnel:**
a. Individuals should have their own targets in relation to safety and should continually seek improvement.
b. Individuals should take care of safety in their own working environment.
c. Supervisors should promote good safety practices.

**Characteristic 4: Safety is integrated into all activities**

**Attributes:**

21) **Trust permeates the organization.**
22) **Consideration of all types of safety, including industrial safety and environmental safety, and of security is evident.**
23) **The quality of documentation and procedures is good:**
a. Procedures should be controlled, clear, understandable and up to date and should be easy to find, use and revise.
b. Documentation should be comprehensive, easy to understand and easily accessible.
c. Responsibilities for preparing documentation and the scope of reviews should be clearly defined and understood.
24) **The quality of processes, from planning to implementation and review, is good:**
a. Work should be pre-planned (including plans for contingencies) to ensure that all safety functions are effective at all times and to ensure that safety is not compromised.

b. Individuals should follow the approved plans and should seek proper approvals before deviating from the approved plans.

c. Work should be planned in sufficient detail to allow personnel to work effectively and efficiently (e.g. resources should be matched to demands, and spares and tools should be available when needed).

25) **Individuals have the necessary knowledge and understanding of the work processes:**
   a. Individuals should have a good understanding not only of their own work processes, but also of how these processes interact with other processes.

26) **Factors affecting work motivation and job satisfaction are considered**
   a. Individuals and their professional capabilities, values and experience should be considered the organization’s most valuable strategic asset for safety.

   b. The reward system should be aligned with safety policies and should reinforce the desired behaviour and outcomes.

   c. Recognition should be given to individuals and teams for exemplary performance.

   d. Individuals should take pride in their work and should feel that their tasks and performance are important contributors to the success of the organization.

   e. Managers should be trained and should have appropriate knowledge of the factors influencing human performance.

27) **Good working conditions exist with regard to time pressures, workload and stress:**
   a. The scheduling of work on safety critical tasks at night should be avoided.

   b. Shift schedules should be based on up to date knowledge of best solutions with regard to human performance and capabilities.

   c. Records of overtime should be kept, trended and acted upon. Planned overtime should be kept within regulated limits.

   d. Managers should be sensitive to stress affecting individuals under their control by, for example, undertaking stress awareness training.

   e. The physical working environment should be conducive to high standards of safety and performance (e.g. standards of housekeeping, provision of equipment and tools, including response equipment, and guarding and signposting of hazards).

   f. Individuals should be consulted about the ergonomics and the effectiveness of their working environment.

   g. Human factor specialists should be made available to the organization.

28) **There is cross-functional and interdisciplinary cooperation and teamwork:**
   a. Multidisciplinary teams (drawn from different work groups and different levels) should be used when appropriate to develop solutions to problems.

   b. Individuals should interact with openness and trust and should routinely offer support to each other.

29) **Housekeeping and material conditions reflect commitment to excellence:**
   a. Managers should not accept long standing problems with items of equipment, systems or processes as ‘the way things are’. Managers should pay careful attention to resolving such problems, even if the solutions are challenging and expensive.

   b. There should be a process for identifying long-standing issues concerning equipment or processes. For example, each issue could have an action plan for its solution.
Characteristic 5: Safety is learning driven

Attributes:

30) A questioning attitude prevails at all organizational levels:
   a. Individuals should notice and should be able to question unusual signs and occurrences and should seek guidance when in doubt.
   b. Individuals at all levels should be encouraged to ask detailed questions in meetings.
   c. Management should be questioning of its own attitudes and views and should actively seek independent views.

31) Open reporting of deviations and errors is encouraged:
   a. The organization should have a variety of established processes to allow and encourage individuals to report abnormal conditions, concerns and events, including near misses.
   b. Recognition should be given to individuals and to teams who report abnormal conditions, concerns and events, including near misses.
   c. Individuals should be comfortable raising safety concerns without fear of retribution.
   d. Managers should ensure that matters raised are acted upon and that feedback on the outcome is given.

32) Internal and external assessments, including self-assessments, are used:
   a. Various oversight forums and processes, including self-assessment, should be used to review, evaluate and enhance the safety performance of the organization.
   b. The number and types of oversight mechanism should be periodically reviewed and adjusted.
   c. Oversight should be viewed positively and constructive use should be made of external or independent opinions.
   d. Periodic Safety Culture assessments should be conducted and used as the basis for improvement.
   e. Senior managers should be periodically briefed and should initiate actions on the basis of the results of oversight activities.

33) Organizational experience and operating experience (both internal and external to the installation) are used:
   a. Processes should be in place to obtain, review and apply available internal and external information that relates to safety, including information on experience from other industries.
   b. Reports on operating experience should be reviewed and actions should be taken to ensure that the organization learns and applies the relevant lessons.
   c. There should be no indications of an attitude of “it couldn’t happen here”.

34) Learning is facilitated through the ability to recognize and diagnose deviations, to formulate and implement solutions and to monitor the effects of corrective actions:
   a. Personnel should be able to have confidence in the corrective action process and should be able to point to examples of problems that they have reported and which have been solved.
   b. Checks should be made to see that corrective actions taken address the real and underlying cause(s) and solve the problem.
   c. There should be a low rate of repeat events and errors.

35) Safety performance indicators are tracked, trended and evaluated, and acted upon:
   a. The causes of safety significant events and adverse trends should be identified and acted upon in accordance with an established time frame.
   b. The organization should use measures and targets in order to explain, maintain and improve safety performance at all levels.
c. Results with regard to safety performance should regularly be compared with targets and the results of the comparison should be communicated to personnel.
d. Action should be taken when safety performance does not match its goals, strategies, plans and objectives.
e. The pitfalls of focusing on too narrow a set of safety performance indicators should be recognized.
f. The organization should be alert to detect and respond to possible indications of a declining safety performance.

36) **There is systematic development of individual competences:**

a. Individual development programmes, including succession planning, should be put in place.
b. Managers and supervisors should be selected and evaluated on the basis of their demonstrated ability to foster a strong Safety Culture.
c. Appraisals of individual development should be carried out to determine the training needs and development needs of individuals.
Pre-course Reading 1: Why Nuclear Safety Culture Requires Humble Leadership

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Abstract: The concept of Safety Culture is widely accepted but not very well understood. In this paper I argue that the attributes of safety culture all hinge on whether the executives in the nuclear plant actually create the climate of trust and openness that the other attributes hinge on. The right kind of executive behavior is especially important in nuclear plants and sites because of the unique characteristics of nuclear technology. In order to create the climate of trust and openness that is required I explain the concept of Humble Leadership as the essential characteristic needed in nuclear plant executives.

Introduction

Safety Culture has almost become a household word in the chemical and nuclear industries. It is promulgated as essential and presented as if we really understood what it means. The International Atomic Energy Agency (IAEA) launched this concept in the mid 1980s and has elaborated it very effectively since then as a set of attributes all of which must be present for a nuclear plant to be safe. When I worked with the U.S. Institute of Nuclear Power Operations (INPO) I found that this organization was also using a very similar set of attributes to describe a safe situation and something to be aspired to in all plants. Since then I have seen the concept adopted in various ways by the Nuclear Regulatory Commission (NRC) and other organizations dealing with safety such as the oil industry following the British Petroleum disaster in the Gulf of Mexico.

In this paper I will briefly review how the IAEA conceptualized this concept and then argue that for such a culture to be actually created requires a particular kind of executive structure and a full acknowledgement of the uniqueness of nuclear technology. I will argue that this executive structure must have particular characteristics and be willing and able to practice Humble Inquiry (2013) and Humble Consulting (2016), which together make up the concept of Humble Leadership.
What is Unique about Nuclear Technology (NT)?

Before reviewing the concept of Safety Culture the point needs to be made that the basic list of attributes which make up safety culture and will be reviewed below can be applied to any effective organization. It could be an automobile factory, a hospital, or a construction company. If we are to use a concept like safety culture in the nuclear industry, we must identify the unique problems and risks of the nuclear industry and consider what the implications are of those unique factors for safety.

In considering what these unique factors are I am mindful of the useful distinctions that Rene Amalberti (2013) makes about the degrees of “maturity” of different kinds of industrial technologies. Is nuclear technology (NT) an industry like ocean fishing that is very dependent on unpredictable natural conditions, or more like certain parts of medicine that are well understood and controlled, but depend on multiple interdependent operators doing things correctly and in a tightly coordinated manner. NT is clearly more like the latter, which creates some of the unique factors I want to mention. These unique factors will not strike anyone as particularly new, but I think it is easy to forget them and not to think through what kind of management system one needs for such a technology.

NT is both very complex and very dangerous

Nuclear technology is so complex and so dangerous that total familiarity with it is essential in all employees connected with it. That also implies that all engineering design must take the technology and its risks fully into account by designing multiple fail-safe routines, back-up systems, barriers, and user-friendly operations. On the operations side, the high degree of complexity and interdependence of components makes it essential that every employee understands his or her role in that system. Pockets of indifference and neglect can be tolerated in most industries but not in NT. It is therefore a unique challenge to executive management to get literally everyone on board, fully trained and fully accountable for his or her part of the operation.

NT is dangerous to the public and to the operators, hence uniquely frightening

Because of its potential dangers nuclear technology is uniquely frightening to the public and to the employees. Not only are accidents potentially lethal and destructive of the environment, but the risks of radiation exposure provide constant danger even if no accidents occur. Radiation is uniquely dangerous because it is invisible and its consequences don’t show up immediately. It is mysterious and hard to understand. The challenge to executive management is to create a climate in which the
employees will not only feel personally safe, but will convey their own confidence in the safe operations to their friends, relatives and the public at large.

**NT accidents create toxic conditions for a very long time in very large areas**

The public has learned from past accidents that a large area around each accident is lethal and remains so for a very long time. The fear of an accident is therefore compounded by the fear of long-run loss of health and territory. The combination of immediate loss of life, threat to health, and long run damage to the environment make nuclear energy more threatening even if the probability of an accident is very low.

**NT is very difficult to run and to manage reliably**

Because of its complexity, running a nuclear plant is difficult and requires special expertise. The parts are all inter-connected in complex ways, which means there are many possible malfunctions, each of which could cause a major accident. Maintaining a level of technical know-how and commitment to perpetual monitoring becomes especially difficult when the work is often routine and monotonous. It is very difficult to define individual accountabilities in a technology that is complex, highly interconnected, and dangerous. Responsibility and accountability are often spread over groups and teams, which then requires effective teamwork and collaboration.

**NT is very costly**

Not only is it very expensive to design and build nuclear plants, but the safety concerns require shutting down and starting up nuclear plants, processes that are themselves very costly leading to very complex formal and informal rules for who can make shut down decisions and under what circumstances they should be made.

**NT is potentially very powerful and useful**

There seems to be wide agreement that nuclear technology is one of the cleanest and most desirable ways to create energy, if the cost factors and the public fear can be overcome. This creates complex decision problems for different countries in how much to invest in new plants, whether or not
to replace aging plants, how much to invest in alternate technologies and how much to invest in alleviating public fears.

In summary, given all of these unique factors and their interaction, the one common element seems to be that safety must be maximized because the consequences of accidents are potentially so severe. The concept of safety culture is an effort in this direction in focusing on all the things that must work together to maximize safety. The question then is what kind of management system will facilitate a safety culture?

**Safety Culture and its Attributes**

I will begin with some quotes from the IAEA, which originated the concept and defined some of the key attributes.

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

“Attributes:”

- Trust permeates the organization
- Consideration for all types of safety, including industrial and environmental safety and security, is evident
- Quality of documentation and procedures is good
- Quality of processes, from planning to implementation and review, is good
- Individuals have the necessary knowledge and understanding of the work processes
- Factors affecting work motivation and job satisfaction are considered
- Good working conditions exist with regards to time pressures, work load and stress
- Cross-functional and interdisciplinary cooperation and teamwork are present
- Housekeeping and material condition reflect commitment to excellence
  (IAEA Glossary, 2007)

These attributes not only cover all aspects of operations but also reflect values and behaviors at all levels of the organization. In fact, taken together, they are practically identical to what any management theorist might list as attributes of any effective organization in any industry. If I were a hospital executive or ran a restaurant chain I would want all of these attributes to be present not just for patient and customer safety but also for overall excellent performance. What is needed for safety is
not fundamentally different from what is needed for effectiveness, especially as concerns accountability, trust and openness throughout the organization.

The attributes are a mixture of some foundation elements, the DNA of the culture, and some derivative elements that can only be present if the foundational elements are present. I consider accountability, trust and openness as those foundational elements on which we should focus at the outset. It is significant that the IAEA list begins with “trust permeates the organization” because none of the other attributes are achievable if there is no trust up and down the hierarchy and across functions. Trust hinges on “openness” of communication, which, in turn, is necessary for employees and managers to feel “accountable” to make all the other things happen that are on the list.

Therefore, “trust,” “openness of communication,” and “accountability” make up a cultural DNA cluster that must be present in the organization if it is to be safe and effective.

How does an organization create and evolve trust, openness and accountability? It is this question that is too often ignored in descriptions of safety culture and in proposals to create or enhance various of the other attributes such as collaboration, housekeeping, and good documentation. If there is insufficient trust, openness, and accountability, programs around the other attributes will fail. What then does it take to produce this DNA in the culture of a nuclear plant? To answer this question we first have to examine the social dynamics of trust and openness, and show their connection to accountability.

Creating Trust, Openness and Accountability—The Role of the Executive Function

Trust, openness and accountability are created and supported by the executive function of the organization. If the Board and the CEO selected by the Board do not value these three attributes, working on the other attributes will be a waste of time. If they do not understand that it is their own values, attitudes and daily behavior that create the trust and openness on which safety and effectiveness depend, then the organization will not be optimally safe and effective. If they do not personally hold their own subordinates accountable for safety and effectiveness, accountability down in the organization will atrophy. The central elements of that executive behavior will be to display trust, to be open and to hold their immediate subordinates accountable for creating trust and openness in their own organizations. These values have to be more than “espoused and announced,” they have to be displayed in the daily behavior of the Board with the CEO and the CEO with his or her immediate subordinates.

The IAEA explanation of safety culture partially acknowledges the role of executive management, as follows:
“The management system shall be used to promote and support a strong safety culture by:

• Ensuring a common understanding of the key aspects of safety culture within the organization;
• Providing the means by which the organization supports individuals and teams in carrying out their tasks safely and successfully, taking into account the interaction between individuals, technology and the organization;
• Reinforcing a learning and questioning attitude at all levels of the organization;
• Providing the means by which the organization continually seeks to develop and improve its safety culture.” (IAEA, 2007)

The main argument of this paper is that promoting and supporting is not enough. The Board and the CEO must actively create the conditions for trust and openness to be developed throughout the organization. The reason for this is that the normal processes of hierarchy and the cultural assumptions of our current management theories actually work against trust and openness, as I have argued in Humble Inquiry (2013). If the CEO does not start and maintain the process in the manner I will describe, it will not permeate the organization. The middle management and the employees will not give priority to safety and effectiveness if they don't see it at every level of management starting at the very top. And, worse, they will not be aware that they are making tradeoffs against costs, productivity, schedules and the just the normal need to get things done. Even if they do become aware of these tradeoffs, they will not have any incentive to tell their supervisors that they are making them.

This upward communication failure produces great blind spots within the management structure. I have seen manager after manager saying explicitly or implicitly to supervisors and employees: “Safety is number 1, but we must stay on schedule and we have important productivity and cost control programs that also matter.” I heard another executive tell his staff: “Bring me a good safety program but make sure it is cost effective,” without any recognition of how that simple “but” destroys the DNA of safety culture.

Why is it not enough just to announce that “safety is always number One?” Most Boards and CEOs in high hazard industries would certainly claim that effectiveness and safety are their central values, so why is there a problem of implementing a safety culture? Because, as Amalberti (2013) has so effectively reminded us-- these are not the only values that drive top management. Products and services can never be absolutely perfect and safety cannot be absolute because executives inevitably have to consider the survival of their organizations, costs, risks, and the human desires to get things done, to satisfice rather than to maximize. Other values and motives coexist with our concern for safety.
For example, when I drive I do not drive perfectly or absolutely safely. I consider how much time I have, the costs of arriving late, my level of fatigue, the weather, how congested the road is, and who else is in the car whose safety I am responsible for. My actual behavior is a product of constant calculation of all these factors even though I claim to be a good and safe driver. Let us now scale this up to a complex organization; let’s say a driving school, in which there are executives, middle managers, driving instructors and mechanics who keep our cars in good condition. As the CEO of this organization I could assume that everyone down to the lowest employees would agree that “Safety is Number 1” because of the nature of the business we are in. I would regularly make speeches to this effect and have posters all over the organization touting safety. But will that be enough to insure that all my managers and drivers and maintenance people will be accountable, will trust each other, will tell their managers about unsafe driving instructors or cars that are not well enough maintained? Clearly not.

In my own experience with organizations, I find that the very nature of hierarchy and the inevitable tradeoff between safety and the other values of efficiency, productivity, schedules, and the need to get work done will undermine accountability, upward communication and trust across hierarchical and functional boundaries.

The commonest version of this problem that I have encountered in most organizations is that subordinates won’t tell their bosses what is wrong down in the organization. The reasons are multiple: “the boss doesn't want to hear bad news;” “the boss says, don't bring me a problem unless you bring me a solution;” “the boss listens politely and never does anything about what I have told him or her;” “the boss is more concerned about schedule and productivity and makes that clear to me” (Gerstein & Schein, 2015). What is missing is the immediate boss creating an environment in which upward flowing information of any sort is welcome, bad news is rewarded so that things can be fixed, and upward communicators are heroes instead of nuisances, whistleblowers, or wimps always seeing problems. Middle managers will not create such a safe and supportive environment for upward communication unless their own bosses create such a climate for them. And so on up the line.

In other words, to implement safety at the level of the various other attributes requires first accurate information about what is actually going on and then a reward system that actually encourages such openness which, it turn creates the trust that we say “must permeate the organization.” Once openness and trust have been created it becomes possible and necessary to hold people accountable for safe and effective behavior. Accountability is created by the explicit behavior of the top-level executives demonstrating trust and openness. It cannot just be assumed, promoted, called for or encouraged, it must first be explicitly created.
The Interaction of Accountability, Openness and Trust

How does one hold one’s immediate subordinates accountable? Let’s start with an example that I encountered a few years ago in a meeting at which the Safety Committee of this Urban Power Co., which included the CEO and all the key divisional VPs, was finally able to agree on a set of “Cardinal rules for employee safety behavior.” If any of these rules, such as not wearing safety equipment or not stopping jobs that were deemed unsafe, were broken, this would lead to instant dismissal, no exceptions. Members of the union were present at the meeting and had, in meetings of their own, agreed to these rules. During this meeting a few words were changed here and there in the list of rules, but the group was clearly headed toward agreement.

Toward the end of the meeting the CEO asked for a vote on the list and the group unanimously accepted it. There was a huge sigh of relief. “We have done it, lets get the list published and distributed, great work everyone! Now lets get on with our other business. Let’s look at how we are doing against last month’s numbers on slips, trips and falls…”

While the group was congratulating itself and preparing to look at their numbers, I felt a sense of unease. Something did not feel right. What was missing and what I found myself asking about was “Now that you have this list and will publish it, will you do anything different with your immediate subordinates tomorrow? Will you ask them how the existence of these new rules will impact their operations? Will you ask them to review the disciplinary procedures in their organizations to decide what to do if there are extenuating circumstances? Will you insure that your subordinates will sit down with their middle manager subordinates to insure that they understand the new rules and how the disciplinary procedures will work? For example, should an electrical worker be fired for not wearing his protective glasses which he took off because they fogged up in the manhole in which he was working and he could not complete his job with them on?”

Should the company be developing along with the list of cardinal rules some inquiry processes that would identify working conditions under which the rules could not or should not be implemented? Should the CEO create and mandate some review processes after important actions have been taken to determine how the implementation of the rules impacted safety, productivity, and schedules? Should the CEO demonstrate through his or her own behavior a commitment to collective learning and frequent reviews of how things are working? All this seemed crucial to me as necessary implementation, yet I felt that the executives in the room had somehow reached the conclusion that publishing the new rules was enough. They had misunderstood what accountability means in a complex hierarchy.

As I feared, the CEO was taking it for granted that the subordinates and middle managers would get the message and sort out all the details. He told me, “They are “professionals” and will be able to...
figure out all the complexities of implementation.” He did not consider that they live in a different world in which daily productivity, staying on schedule, doing things in a cost effective way all compete with figuring out how to change the discipline system to reinforce the “cardinal rules list.” Middle managers and supervisors and employees might very well see this as the “safety project of the month” and just pay lip service to it, or, even worse, see it as one more chore to be administered and one more difficult problem to be dealt with once rule violations occurred.

I realized that one of the assumptions of traditional management theory is that when people take on a set of responsibilities they will hold themselves accountable. This assumption is derivative from the belief that “delegation” is a good thing; it makes the subordinate more responsible. Delegation avoids micromanaging, which most subordinates hate. We then build very general rewards into the system and measure managers on productivity, efficiency, and safety statistics but, paradoxically, do not measure them on frequency of upward communication or on the degree to which they foster psychological safety for their own subordinates. What that means is that if middle management or supervisors don’t take seriously the implementation of the program, top management will not hear about it! They will not learn that things are not being implemented if they have to be traded off against other important goals. This is why openness is such a critical value. If top management does not hear about how things are going down in the trenches, they will assume that things are done in a way that supports their intentions.

How the intentions to create safety can be undermined unwittingly is illustrated in the following example. A power company had instituted a very important safety program that trained employees to use a “time out card” to stop a job if anyone felt it was unsafe. The job could only be resumed after a safety inspector had cleared it. The program became a key part of the whole safety effort because it was working so well in reducing injuries and accidents. The operating system in this organization was old and in need of constant maintenance. It was not always clear where maintenance was needed most urgently, but it was discovered that the time out program might provide critical information that would enable the organization to decide better where the big risks were that needed immediate attention. The company therefore instituted a records keeping program that required each supervisor to write a brief report of every timeout. Middle managers would collect these reports, analyze them and send information up to maintenance on where attention was most needed.

But then the next higher level of area managers (who were measured largely on productivity and efficiency) noticed that work groups with the same jobs had different levels of time outs. They called in the supervisors of groups with the larger numbers and inquired, “Why does your group have so many time outs?” Those supervisors now knew for the first time that they had more time outs than other groups, did not like the implications for their own advancement and promptly told their group not to be such wimps and not to call so many time outs. The number of time outs went down, yet
defeated the very purpose of the time out program because groups began to take more risks in their work. And, worst of all, senior management did not know this was happening. There was no incentive for supervisors or middle managers to report or to worry about this. I found out about it in focus groups that I led as an outside consultant.

The middle managers in this organization did not take it as a central value to create a climate of openness and to reward their subordinates for bringing in time out information. They did not feel that it was an important part of their job to make subordinates feel psychologically safe to bring in negative information. Their own bosses did not evaluate them on the degree to which they created a climate of openness and the formal reward system did not in any way measure or evaluate such managerial behavior. Why not? Because senior executives did not evaluate themselves or their own immediate subordinates on the degree to which they encouraged upward openness. Their blind spot was failing to see that if such behavior is not explicitly encouraged and rewarded by themselves, the tradeoffs down in the organization will go in the direction of productivity, efficiency and schedules. Senior management did not know what was going on because there was no incentive for lower levels to report upward what they were willing to tell me as the outside consultant in focus groups. Employees and their immediate supervisors even learned not to trust upper management because they felt that they were actually punished for having too many time outs instead of rewarded for being more safety conscious. Many employees said in the focus groups, “They don’t really care about safety up there, it is just window dressing” and this occurred on the same day that I had heard the CEO say, “Safety has to be our number one priority.” Had I told him then and there what the employees were saying, he would have discounted it as just a few malcontents.

Confusion about “accountability” enters the equation when top management is surprised and shocked to find out how lower level managers and employees are subverting the time out program by either not seeing or not reporting what was happening. Senior managers would say to me that one of the problems of the organization was “lack of accountability.” If I asked them for examples, they would tell me that lower level managers and employees could not be trusted to do things safely. They could not see that the problem was lack of upward openness which prevented them from finding out why those managers and employees were not more responsible. They could not see that the only way to fix that was not by more rules and announcements and programs, but by holding their own immediate subordinates accountable for upward communication. That, in turn, requires a different kind of behavior from those top executives—what I will call Humble Leadership and describe below.

For subordinates to begin to tell their superiors what is really going on requires that they feel psychologically safe (Edmondson, 2012). Such safety is necessary because the nature of what they need to tell their bosses is, by definition, very sensitive in that it might imply that the boss is not doing something correctly or must change some things that he or she has mandated. The commonest version
of this difficulty is to tell the boss when a target that the boss sets for some aspect of the work is unrealistic from the subordinate’s point of view. In the Marine Corps a good leader, one who earns the respect and trust of the troops, is the one who knows that the troops are used to walking 25 miles a day but asks them occasionally to walk 26 miles because he knows that they can do it. The troops would lose respect for him if he asked them to walk 30 miles because higher command had demanded it even if he knew deep down that they probably could not do it. Yet that is precisely what a lot of managers and leaders do. They set unrealistic goals and make it difficult for the subordinates to speak up to say they cannot do it. Or, even worse, if they try to speak up, the boss says, “Well we have to do it, so just work a little harder.”

The most dangerous aspect of developing such blind spots is that CEOs unwittingly create a climate where achieving goals becomes so non-negotiable that it forces subordinates to cut corners, falsify data and actually lie about what is going on in the organization. We saw this occurring in recent years in the U.S. Veteran’s Administration when unrealistic targets were created for how many patients were to be seen by a certain time without sufficient conversation to determine whether or not such goals were realistic given the increase in patient load due to combat results from current wars.

Top management in Washington insisted on meeting the numbers, which led many local offices to be forced to falsely records and claim that patients were being seen. When this was discovered and a public scandal ensued, the first reaction was that it was “a few bad apples in the barrel,” a “few irresponsible middle managers and employees” as the explanation. It took some careful soul searching and further data gathering within the organization to get past this knee jerk reaction to the recognition that setting unrealistic goals and not listening to subordinates who were saying “we cant do it” was the real cause of the problem.

Part of the problem is traditional management theory, which encourages competition as a motivator. Whenever an organization has several units doing similar things there is the strong temptation to have them compete and reward the ones who meet the targets best. We have all witnessed how comparing units on safety statistics does not necessarily reduce accidents but does reduce the reporting of accidents because units are encouraged to compete to see who can be the safest. Again, the real pathology in the system is that managers do not feel safe in reporting to their bosses that they are “gaming the system.”

Holding subordinates accountable requires a great deal of direct conversation about goals, about how they will be accomplished, about difficulties that might be encountered, and about how accountability will be created in the next level down. The CEO not only has to have these conversations with the immediate subordinates but must also inquire how those subordinates will have conversations with their subordinates to insure consistency of implementation of the new rules. What
I have seen all too often is CEOs being so concerned with upward and external communications that they forget to make their subordinates accountable and don’t inquire about what may be going on in middle management and below.

Accountability through Openness and Inquiry

So what should CEOs do to insure that their subordinates and the whole organization becomes more open, more trusting, and, thereby, more accountable? What should my power company executives do after agreeing on the list of cardinal safety rules? What should the top VA executives have done when the high-level performance goals were mandated by the political system? The head of the VA should have sat down with each of his geographic unit heads and asked: “Can you meet these performance targets?” “If not, what additional resources do you need to meet them?” “What might prevent you from achieving the goals and what should we do about those conditions.” Had the VA heads done this in a psychologically safe climate, the regional heads might have revealed sudden increases in case loads that made the goals unrealistic even with additional resources. Of course the higher levels do not want to hear this because that requires them to go to their politician superiors and say, “Sorry, we just cannot do this.” The information then either does not surface or is ignored and scandals result from the inevitable falsification of what is actually going on.

Unfortunately, our traditional management theory would say that senior managers should go to their subordinates, restate the targets, explain in detail how the top level goals were set and why they were so necessary, and in a perfunctory way, say “Any questions?” Having been told all the reasons and how important the goals were, would a subordinate be able to say, “I don’t think we can meet those targets.” The courageous subordinate might say, “I think we will need additional resources to do this,” only to be told, “You know we have used up our discretionary parts of the budget for this year, so just do the best you can, there wont be any more coming.” Very likely the boss’s “explanation” will function as a stonewall that cannot be breached.

To overcome some of the cultural assumptions of traditional management theory, especially norms about competition as a good motivator, assumptions about bosses as motivators and controllers, and norms about the importance of maintaining “professional distance” across rank boundaries and between functions, requires a different concept of the role of the manager, especially the CEO as the most senior manager in the organization. This new role becomes critical as the complexity of problems that organizations face increases which makes the manager as the lone hero with all the answers no longer viable, especially in nuclear plants.
**Humble Leadership—The New CEO Attitude and Behavior**

I have argued that to create upward communication and, thereby, the necessary openness, trust and accountability that we need for an effective safety program will require new attitudes and behavior on the part of the CEO. CEOs and others below them will have to recognize that their own performance ultimately hinges on the performance of their subordinates and the whole organization. The more complex the technology that underlies the production process, the more the requisite knowledge and skill will be distributed among the lower levels. No matter how much authority and raw power the CEO has, he or she will be, to varying degrees, dependent on the subordinates and those below them. Hence this new form of leadership hinges on the capacity of the CEO to be humble (Schein, 2013, 2016). Humble Leadership can best be explained by looking at several components that are directly in conflict with traditional management theory.

**Here-and-now Humility**

I think of this as “here-and-now” humility that has to be present when CEOs are in conversation with subordinates upon whom they are dependent. With such here-and-now humility goes the ability to make oneself vulnerable. CEOs who always tell are effectively insulating themselves from information that their decisions or actions might be dysfunctional or not implementable. To create a climate in which subordinates can tell the CEO how things are not working or might not be implementable leaves CEOs vulnerable to learning things that they might not like and that challenges their decisions and plans. They might even have to go back to their Boards or higher-level CEOs to undo some things that had already been put into motion.

A significant example of such humility was the admission by senior military officers carrying out operations in Afghanistan that “command and control” no longer worked when the troops were dispersed, were in different kinds of local environments, had different on the ground challenges, and, therefore, had to be given the autonomy to make their own decisions. The Generals has to ask, “What is going on out there and what do you think you should do” instead of telling: “Here are your orders.”

**A New Superior-Subordinate “Level Two” Relationship**

In my new book Humble Consulting (2016) I point out that the broader cultural norms by which we all live and get along make a distinction between “Level One” transactional and professional relationships, and more personal “Level Two” relationships which are characterized by varying degrees of “friendship” but also includes “people whom we know as individuals and whom we trust...
not to cheat us or to lies to us.” Beyond this there is also Level Three, which we can think of as more intimate relationships.

When problems are simple the transactional relationship works. We call the repairman, doctor, and lawyer and accept their professional expertise. The boss trains the subordinate, explains what is to be done, and then just measures results. However, when problems become complex and messy, when it is not clear how to fix things, when everything is connected to everything else, when problems are systemic, then Level One transactions and expert help no longer work. The boss as expert cannot know enough of the subordinate’s world to give precise directions.

With messy complex systemic problems, the subordinate should tell the boss that something is wrong, but does not necessarily have the insight (or the courage) to report precisely what is wrong or how to fix it if they are in a Level One relationship. In that kind of situation, the two together have to get to a more personal Level Two relationship in which it becomes safe for each of them to be more open, to reveal what is really worrying them, to admit that they do not see an immediate answer, that they do not know what to do, but can work together to try to figure out some adaptive move to deal with the immediate worry.

In these situations Level One relationships prevent good adaptive problem solving because the norms of “professional distance” undermine openness and shared problem solving. The doctor who walks into the patient’s room, looks at the chart, addresses his resident and the accompanying interns instead of the patient, will not find out that the patient has asked a couple of friends about the prescription she was given, was told not to take it because “it makes you feel awful,” but has neither the inclination nor the courage to tell the doctor that. On the other hand, the oncologist who developed a Level Two more personal relationship with my wife during her first bout of breast cancer learned from her that the course of chemotherapy would interfere with an important trip to California that we had planned. He discussed all the options with both of us and decided to arrange to have part of the chemo done in California so that both the treatment plan and our personal life style could be maximized. As a result she learned to trust this doctor completely, which was crucial when later difficult decisions had to be made.

An interesting example of the importance of such openness is reported in Perin’s Shouldering Risks (2005) when an unexplained hot spot was found in a transformer outside the nuclear plant and the question arose who should make the decision to shut the plant down in order to find out what was going on in the transformer. The complex tradeoffs between risk and the cost of shutting down the plant had to be shared by several levels of the hierarchy in order to make a sensible adaptive move. The operator who found the hot spot, the shift supervisor, and the plant manager all had to be involved and had to be completely open with each other in order for an effective move to be made.
When such inter-level openness is not there we get the situation in New York where a transformer was hit by lightning spilling PCBs into the area. The engineer in charge did not have an open enough relationship with his boss to report the PCBs because he did not believe the data. He had monitored this transformer and “knew” there could not be any PCBs, asked the lab to check the data, and learned a week later that the PCBs were there and had, therefore, exposed firefighters and others to the harm. A lawsuit and many recriminations resulted and it was only six months later that it was discovered that the PCBs were in some sealed sound deadening rods that had been installed at a time when PCBs had not even been named as harmful. The point of the story is that the engineer did not have the kind of open Level Two relationship with his boss that would have enabled him to say, “I found PCBs, I don't believe it can be accurate because I have checked this transformer over the years, what should we do?” Together they could have decided to immediately pass this information on to the fire department and other authorities and saved themselves and the public from a lot of messy recriminations.

**Personalization, the Key to Level Two Relationships**

Our cultural learning pretty much tells us the difference between staying at the polite level of conversation with strangers or in pure transactions with sales people, and what it means to get “more personal” as when we “want to get to know someone better.” Level Two implies that we now know the other as a person, not as a stranger is a certain role. We get to know the person’s name, something about their background and, most important develop some motivation to get to know them better, to enlarge the relationship to some degree beyond the formal transaction. When we are motivated to enlarge or deepen the relationship we do this in conversation by “personalizing.”

The essence of personalization is either to ask something more personal or to reveal something more personal. That might be as simple as the doctor saying to the patient, “Well Mrs. Jones, you are looking perky today and I see you put on a very pretty shirt,” instead of, “Good morning, Mrs. Jones, how are you feeling?” It might be the boss saying to the engineer, “Weren’t you really scared and upset when you found out about those high PCBs?” instead of “Ok, here is what I want you to do,” or “So what will you do next, what is your plan?”

There is no formula for personalization. The cultural rules about what is personal, what is intimate, what is politically correct, and so on will vary with the culture and with the times. Personalization is more of an attitude built on the motive to build a relationship in which boss and subordinate can be more open with each other and trust each other. It is an attitude that is built on the value of listening to each other and building empathy for each other’s job and role.
There is, however, an important guideline. We all learn within our cultural upbringing what can be called “Situational Propriety.”

**Situational Propriety—Task Related Personalization**

Part of our socialization into a culture is to know what is appropriate in different kinds of situations, what is often called “etiquette,” “tact,” or “good manners,” or knowing what is “politically correct.” Hierarchical relationships are bound by cultural norms of proper “deference” by the subordinate and proper “demeanor” by the boss. Personalization in this relationship does not mean we abandon those norms, but we evolve new norms that elicit more openness around task related information. As one of my German students told his more laissez-faire American peers, “When I go in to see my boss I click my heels, shake his hand, stand very deferentially, and then tell him the truth.”

The personalization should be oriented to the task and the shared goals of what the boss and the subordinates are trying to do in the context of the mission of the organization. The goal is not to become intimate or even to become friends. The goal is to achieve the openness and trust needed to get the job done effectively and safely. To talk at a personal level about how scary it was to find a hot spot in the transformer or the PCBs after the lightning strike is not the same kind of personalization that two neighbors might engage in to become friends or that two people on a date might do to test their level of mutual attraction. Personalization has to be situationally appropriate. When Ken Olsen, the founder of Digital Equipment Corporation, would wander around the engineering department and suddenly sit down with an engineer and ask out of genuine curiosity what that engineer was working on, this led to open Level Two relationships. When Ken lost his temper and became very personal with a subordinate and criticized him in front of others, that was viewed by everyone as very inappropriate and led to great distance between Ken and that subordinate.

**Process Focus**

There is a second guideline for personalization—the boss can ask the subordinate, “Here are the goals, how are you going about meeting them?” The doctor can say, here is treatment program, “How will you implement it?” An extreme example was provided by my mentor Douglas McGregor in his story of how he helped a CEO create an executive development program. The company CEO wanted Doug to create and implement such a program. Instead, Doug asked a question about the reward processes in this company, “Do you have a bonus program for your subordinates?” When he learned that such a program existed, Doug wondered out loud, “What would happen if you told your
subordinates that from now on, half their bonus would depend on how well they developed their own subordinates, and that you (the CEO) would ask them to report monthly and in person on what they were doing and how it was working out.” The CEO tried this out and within half a year had an excellent program that they had collectively worked out and instituted. The CEO did not care about or mandate the details of the development program but created open discussions with the subordinates on what each of them was doing. 

Another version of using process focus for personalization is to ask process questions about the conversation itself. A boss and a subordinate having a conversation about work related issues can at any point ask, “Is this helpful, or, is this want you wanted to hear, or, should we be approaching this differently?” In other words the process of the conversation itself can often be usefully discussed. Perhaps the best example is the process decisions we make about giving and receiving feedback around performance or development. Just sitting the subordinate down and telling him or her what we think, what our judgments are, what others have said is a Level One relationship process that is usually ineffective because the recipient either does hear the message or does not know how to interpret it.

An effective boss should personalize this process and bring it toward Level Two by first asking how the subordinate feels about his or her own performance, what the goals and aspirations were, and, therefore, in what specific areas the subordinate particularly wants and needs feedback. Asking, “what were you trying to do, what were your goals, how do you think you performed against them, in what areas do you need help, what kind of feedback can I usefully give you,” personalizes the relationship and opens the communication channel to enable the subordinate to tell what is really on his or her mind. That mutual openness must be the goal for a long run trusting relationship to be achieved.

**Joint Problem Solving and Adaptive Moves**

With messy complex problems the best problem solving process is what has been appropriately called “Joint Sense Making” (Weick, 1993). Once a Level Two relationship of trust and openness is operating, the boss and the subordinate should work together on whatever brought them into the conversation. If the subordinate brought up a safety problem, they should now talk together on what the options are for the next adaptive move. They each bring something to the conversation, which will result in a better move than if either of them felt that they had to make the next move on their own.

If the problem is simple, they rely on whoever has the most expertise and experience to decide what to do. If the problem is complex, messy and involves systemic interdependencies, then they pool their knowledge and insights. What they decide to do should be thought of as “adaptive,” i.e. deal with the problem as they jointly see it, and should be a “move” not a whole big intervention or
massive program. Adaptive moves are often needed in order to elicit more information and to test how different parts of the system may react. They are often “small changes” rather than massive interventions.

**Joint Learning, Teaming**

The joint problem solving that is enabled by Level Two relationships often involves not just the boss and subordinate but a wider group representing different parts of the system. Edmondson in the book Teaming (2012) has made a crucial point that for an interdependent group to work together effectively, they must actually learn together. The point is that just getting to know each other and becoming a team is not enough. It is only through confronting complex messy problems together that they get to know each other at the necessary deeper level and evolve joint coping mechanisms for future action. This kind of learning together is especially relevant where different subcultures are involved across functional or hierarchical boundaries.

In the example of the PCBs released from the transformer accident the engineers, the public relations managers, and senior management together had to face the criminal charges launched by the people exposed to the dangers. They had to learn together how to think about problems like this if they occurred again, leading to both a different set of rules about reporting dangers and a whole different approach to educating the environmental agencies on how the company was evolving its safety programs. This learning process resulted in a whole new adaptive move—invite representatives of the environmental groups to attend safety programs in the company so that they could see what the company was doing. Building Level Two relationships with the outside evaluators enabled the company to display all of its constructive efforts so that if another accident happened the outsiders would at least know that it was not company negligence.

**Trust, Openness and Accountability Revisited**

Trust and openness are tightly intertwined. If I think that you are withholding information or telling me lies, this defines low trust. If I want to build trust, I must not only be more open with you, but I must be willing to hear what you have to tell me. I must reward you for bringing up problems, for challenging unrealistic goals, for keeping me posted on how things are going. It is not enough to say, “I have an open door.” The CEO must actively seek information by walking around, scheduling regular meetings with subordinates, telling stories that illustrate the importance of upward communication.
Trust can be thought of as the ability to predict what you will do in relation to the things we both care about and have agreed to in our working relationship. I trust you if I know that you will tell me the truth, not withhold information relative to what we are doing or care about, be willing to make commitments and hold to those commitments, and understand what I am trying to tell you with an air of acceptance. Trust is built up over a series of interactions where the commitments are tested. As I feel you are open with me and keep your commitment and promises, I build up trust, which takes time. If you withhold, lie, or fail to keep promised I lose trust very fast. Our feelings toward each other get tested in conversations such as the ones I suggested above for the CEO to hold with each subordinate around goals and accountability.

A corollary to the argument that the CEO must do this with his or her subordinates is the further argument that unless the CEO does this with immediate subordinates, there is no guarantee that those subordinates will have such inquiry conversations with their subordinates. They may know that the CEO cares about quality and safety and even observe the CEO pronouncing it to the outside world but they will revert almost always to focusing on what they get measured on which most likely will be schedules, and productivity.

In summary, communication and team building programs for middle managers and employees will have little effect if top management has not launched the organization with safety and effectiveness values and embedded them through role modeling them in their own behavior. Trust will not be fostered if top managers do not trust their subordinates and, even more important, if subordinates do not trust their bosses to listen for and act on information that they bring that pertains to quality and safety.

So What Management Structure do Nuclear Plants Need?

In order to create the cultural DNA that will enable all of the other components of the Safety Culture it all begins with the Board and the selection of the CEO. The Board and/or the Corporate or Site Management must select a CEO who has two critical attributes: 1) Nuclear knowledge and/or experience that provides empathy for the unique risks, dangers, and advantages of the nuclear technology, and 2) The attitude and skills of Humble Leadership.

If such a person is selected, he or she will immediately create the conditions for a safety culture by his or her behavior with the immediate subordinates, seeking a Level Two relationship with them that will convey immediately the necessity for complete task related openness. That Level Two openness will begin to build trust and psychological safety for the immediate subordinates.
The CEO then has to create as a central part of the reward system for the immediate subordinates that he or she is holding them accountable for creating Level Two relationships with their subordinates and that they will perpetuate this reward system below them.

The CEO then will make the immediate subordinates and all the managers below them accountable not only for task performance but for creating and maintaining openness as a condition for building trust.

In conclusion, I am arguing that if the CEO does this, all the other attributes that are considered necessary will become possible. If the CEO does not have these attitudes, skills, and display these behaviors, the other attributes will not be achievable.
References


Pre-course Reading 2: The Concept of Leadership – A Short Introduction

Johan Alvehus, Ph.D.

Abstract: The concept of leadership has a long history, and is often used as a fundamental way of explaining human and organisational behaviour. In everyday parlance and in popular press, leaders are often attributed the success or mishaps of organisations. Some leaders become glorified as heroes, others are stamped as villains.

From a social science standpoint, leadership has been on the research agenda for more than a hundred years. Practitioner literature starts earlier; often Niccolò Machiavelli’s *The Prince* is highlighted as an early example. In this short text, a number of important distinctions regarding leadership and leadership research are highlighted. No full account of leadership theory is made.

**Trait theory**

One of the earliest leadership research directions is called trait theory. In this, researchers look for individual traits, inherited or learned, that are connected with leadership. Despite much research efforts, several researchers (e.g. Stogdill, 1974) have not been able to determine which traits are unambiguously related to leadership. The interest in charismatic leadership in the 1990’s can be seen as a revitalization of trait theory. Many of the characteristics singled out as important for leadership seem, however, to be traits that are important also for being successful in other domains (e.g. professional/vocational development), which makes it difficult to see them as only being about leadership.

**Style theory**

Style theory focuses on how leaders behave. Common dimensions are task orientation vs. relationship orientation and authoritarian vs. democratic leadership. As in trait theory, research has come up with inconclusive results regarding which styles are efficient. Some researchers have emphasised the importance of leadership as being situation oriented, i.e. that efficient leadership is about being able to adapt to different situations by employing different leadership styles. Leading in a crisis differs from leading routine work, and aspects such as follower maturity and professional context influences the situation. Style theory often portrays leaders as having one style, sometimes it emphasises the importance of being able to shift between styles. These studies contrast with the studies of managerial
work, where everyday organizational life is portrayed as more fragmented and ad hoc than the styles approach implies.

**Followership**

Some researchers have shifted the interest from leaders to followers. Instead of asking questions about who leads and why, they ask questions regarding why people follow. Here it is also noted that most leaders are themselves followers, as they are embedded in a hierarchy. As noted above, on situational leadership, followers have been taken into account in earlier approaches. Followership research has also, however, directed the interest towards how followers construct leadership. A noted by sociologist Bruno Latour (1986), the power of the leader is always in the hands of the followers, since if no one follows there will be no leadership.

**Sense-making**

In a sense-making perspective, leadership can be understood as the management of meaning, i.e. leadership occurs when someone (the leader) influences the way others (followers) make sense of the world (originally coined by Smircich & Morgan, 1982). Leadership is thus a question of framing and enacting a certain reality. In many ways this line of inquiry has opened up for research on leadership taking a more constructivist view on the topic.

**The leadership/management distinction**

Some theorists want a distinction between leadership and management. Management then refers to practices such as administration, control, rewards, and planning, while leadership refers to inspirational, motivational and visionary aspects. These can sometimes come together, but in the “new leadership” approach of the 1990’s, a common call was to focus less on the management aspects and highlight the importance of leadership. Authors such as Bass (1990) distinguished between transformational and transactional leadership, the latter more associated with traditional managerial activities while the former (more wanted) form is characterised by charisma, inspiration, intellectual stimulation and individualized consideration.

Researchers in the managerial work tradition, on the other hand, emphasise the importance of everyday managerial activities. These studies often focus on what managers actually do, and consistently emphasise the prevalence of mundane and ad hoc activities as constituting the bulk of
managerial work. (For a recent overview, see Tengblad, 2012.) This line of research is often less concerned with normative statements on what leaders/managers should do and is more concerned with what the actually do. Leadership research and managerial work research have, however, largely become to separate fields of inquiry.

**Methodological problems and the practice approach**

While leadership is often defined in terms of a process of influence between leader and follower (Yukl, 1989), the methodological underpinning of studies (especially in the anglo-american tradition) is often based on quantitative approaches using questionnaires. Bryman (2004) notes that since the 1980’s, 85 % of leadership research has been quantitative in nature, and of the qualitative research, the main bulk consists of interviews (Conger, 1998). Some authors have raised concerns about the relevance of these types of studies, since they generally do not actually study the process of influence; rather, they study various views or opinions regarding the process.

From this critique, a recent development in leadership research has been the practice approach (Carroll et al, 2008). Here, leadership is approach from the point of view that it is something that is done in organizations, activities undertaken by ‘leaders’ and ‘followers’ alike, and that the very categorization of ‘leader’, ‘follower’ etc. is problematic. This line of research is still in its youth but has led to important questioning of core concepts in the leadership field.
References


Abstract: This essay develops the reasons for looking at the more subjective side of culture based on the need for better conversations and develops a more organic, complicated and detailed description of culture based in “articulated” answers to basic human questions. Based on this it presents an account of cultural transformation based in active collaborative dis- and re-articulation of co-residing human rationalities. The analysis supports active direct participation by diverse stakeholders since we know of no other way to get the creativity, commitment, compliance and situated customizations necessary for safety culture innovations. It ends with a presentation of the vision-align-invent-act-adjust cycle as a way to facilitate sustainable change.

INTRODUCTION

Much has been written on “safety culture” over the years in the operation of atomic energy facilities. For the past several weeks I have pouring through thousands of pages of impressive, incredibly detailed and instructive documents produced both by IAEA and others on safety culture [1,2,3,4]. The amount of literature and advice is staggering. Important progress is being made.

Rather than review this, my concern here is add a dimension to further reduce the likelihood of man-made and man-contributed near misses and disasters. Certainly culture is to be blamed at times, changing culture is difficult, and many organizations do not have a lot of culture change expertise. I am not a safety expert but a culture change expert. Working across industries and countries I have found that challenges of change are often the same. Based on these comparisons, I believe that much has been done to improve the behavioral side of safety culture. But more is needed on what might be considered the subjective side of culture, those parts dealing with trust and the complexities of being human.

Let us take Kiyoshi Kurokawa’s conclusion on the Fukushima Nuclear Accident: “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. Had other Japanese been in the shoes of those who bear responsibility for this accident, the result may well have been the same.” [5]
As bold as this is, the Independent Investigation Commission report, like most others finally argues for mostly doing more of the same, only better: better monitoring and enforcement, clearer information exchange, stronger laws, quicker response to up-to-date practices, more consolidated chain of command. All too often we call for more of the same only better, but still offer little on addressing culture change itself. I want to add a more nuanced human face to cultural change though discussing managing hearts, minds and souls. Managing these is better thought in a collaborative conversational model rather than in interventionist presentational models.

Culture is a term often used in regard to safety since policies, instructions and behavior management alone do not seem sufficient to reach desired safety outcomes. But we continue to meet regarding “safety culture” because we have not yet reached the full potential of cultural management. At least part of the reason for this, I believe, arises from the rather mechanical way many have thought and talked about culture. A culture of how to talk about culture exists. Many of the discussions have treated culture as a “thing” that people have that can be changed. Managerial actions from this perspective are often ineffective, short-term and produce resistance to change.

Here I will first develop the reason for a look at more subjective side of culture based on the need for better conversations and develop a more organic, complicated and detailed description of culture. I will show why active collaborative interaction across organizations and organizational levels is essential to building and inculcating safety culture. I will then detail why change is so often resisted, temporary and ineffective. And finally I will sketch how to implement sustainable change. I will not spend much time with precise (and often academic) definitions of “safety culture,” rather I will focus on what using such a term is to help us achieve.

None of this is intended to minimize the importance of traditional forms of control in enhancing safety in the forms of guidelines, supervision, inspections, etc. But we need to do more than this. As is clear in a recent IAEA report: “The nuclear industry critically depends on people following rules, standards, processes and procedures. Equally important, however, is the development of thinking, engaged employees such that blind adherence to procedures does not give rise to weaknesses in the ability to recognize and respond to unusual circumstances.” [3]

Managing safety culture is to extend safety producing decisions and practices deeper into the everyday design and construction processes. Reports from several industries and military and fire-fighting indicate the endless presence of the “fog of war” and the difficulty of rationalizing complex situated choices. A balance is always important between a knowledge-based command and control structure and an intuitive street wisdom. Safety is based on both and knowing when each matters. Clearly each of these will play out differently in different cultures; we will not have a single approach. [6] But we
can build some understanding of process of change even if the products are different in different places.

“Safety culture” as a concept helps us go beyond supervision, rules and norms. Managing the hearts, minds, and souls and not just behavior is critical. Safety culture could well be considered to be: “The things that you do spontaneously for the health and well being of others when no one is watching.” And, further, this deeper cultural sense impacts the rational and explicit procedures and guidelines both in content and as interpreted in practice.

2. THE CONCEPT OF CULTURE

Managing hearts, minds, and souls—the subjective side of culture—has always been considered important. The role of leadership, and what I will develop as collaborative practice, in managing culture has been a key part of it. Examples are numerous. In Eastern cultures this was well presented early on by Lao-tza in The Way of Life:

A leader is best
When people barely know that he exists,
Not so good when people obey and acclaim him,
Worst when they despise him.
Fail to honor people,
They fail to honor you;
But of a good leader, who talks little,
When his work is done, his aim fulfilled,
They will all say, "We did this ourselves."

The Western world’s concern with managing culture can be traced to a funeral oration by Pericles in 431 BCE. Pericles, often recognized as the father of the Athenian’s Golden age, was attempting to inspire unity in his people in their battle with Sparta. The speech effectively displayed the three central elements of establishing a strong operant culture: determine what makes the organization what it is, what it wants, and eloquently communicate that to the organizational members. A process we now call identification. But the actual practice of this is difficult especially in the diversity work situations of today.
For some time scholars and managers have tried to get a handle on the elusive subjective side of work life. Whether the concern has been with “spirit,” “climate,” “meaning of work,” or “quality of work life,” the core issues have been the same. Human beings are more than rational creatures. They are not animated machines. How employees personally feel, think and see has a significant impact on the character and quality of their work, their relation to management, and their response to innovation and change.

3. CULTURAL CHANGE

We are together today to discuss cultural change. The concern is not foremost with what “safety culture” is but how to accomplish internalization of particular ways of thinking, feeling, and prioritizing actions, especially when indigenous national, organizational and community “cultures” are less than supportive. Rather than an abstract definition, I think “safety culture” can best be thought in personal terms as, "An attention to detail in decisions and work fostered by mindfulness that my actions and choices could harm my loved ones and the loved ones of others.” An ultimately successful internalization means having all stakeholders say: “We did it ourselves.”

3.1 Conceptions of what needs changing

Allow me to stay with the Fukushima case for a moment. The independent commission report moves from an indictment of “national culture” to the difficulties of the TEPCO corporate culture: “Across the board, the Commission found ignorance and arrogance unforgivable for anyone or any organization that deals with nuclear power. We found a disregard for global trends and a disregard for public safety. We found a habit of adherence to conditions based on conventional procedures and prior practices, with a priority on avoiding risk to the organization. We found an organization-driven mindset that prioritized benefits to the organization at the expense of the public.” (p. 21) And as it goes on: “TEPCO must undergo fundamental corporate changes, including strengthening its governance, working towards building an organizational culture which prioritizes safety, changing its stance on information disclosure, and establishing a system which prioritizes the site.” (p. 22)

The question of “How to achieve national and corporate cultural changes?” is paired with the question, “Why has meaningful changes not already occurred?” Why has integrating broad societal and corporate goals with safety goals been so difficult to achieve? And, importantly here, “What is the nature of useful conversations about this?”
2.2 The origins of bad conversations

Looking at “accidents” across sites and industries some conclusions stand out. I will conceptualize these as bad conversations, conversations that have built into their structure the seeds of inaction.

*Origins of bad conversation 1:* Safety is often conceptualized as supplementary or competitive with other goals including economic ones hence the talk focuses on compromise and trade-off rather than mutually beneficial integration.

*Origins of bad conversation 2:* Explaining events as based on “culture” leads to faulty attributions and a kind of pacification and action frustration based on both an exaggeration of the problem (this is too big to deal with) and a trivialization of it (it’s just culture).

*Origins of bad conversation 3:* Culture is discussed in psychological terms as socialization and deep values and beliefs, hence the only change processes available tend to create resistance and tend to overlook the way culture is integrated and works.

*Origins of bad conversation 4:* Culture change is discussed as something you do to people, hence the core concern is with getting buy-in and getting people to give up bad behavior.

In contrast here “safety culture” is considered to be an integral part of a high performance organization; culture is treated as term that helps us pay attention to complex human choice making rather than an explanation of them; what has been called culture is best described as a systemic set of connections; and lasting cultural evolution and transformation is a respectful collaborative accomplishment.

4. THE CULTURAL SYSTEM

Culture is not a thing, a force, nor a power. It is a word we use to help us pay attention to a relatively stable set of relations in a complex system. In perhaps an overly simple way, we can say each cultural system is an answer to six basic human questions. How should I feel? Who am I? What are the social rules? What are the facts? What is good, right and beautiful? What is just? The particular answers help each individual attend to certain features of the world and not others, think through things in a particular way, and choose actions. These are shared as a way to justify and sense-make.

One of the reason many cultural interventions fail is that they focus on the question of facts and believe that all would work better if people were more fact-based rational. The forms of rationality based in answers to the other questions are disregarded, diminished or even considered problematic.
This cannot work because these are equally real and important. Whether liked or not they remain part of every choice.

4.1 The articulation of rationalities

Further, the answers to these six questions do not exist as isolated rationalities. They are “articulated” with each other and their stabilities come with the redundancy of these articulations. Allow me a moment to develop this concept of “articulation.” Articulation is a process of expressing two independent entities together. In a mathematical analogy, articulation changes an orthogonal relationship into an oblique one.

Imagine a child who conjoins “good,” “fast,” and “red” in relation to toy trains. If this child is given a yellow one, the disappointment come not just from the color but because it is not perceived as “good” and “fast.” The affect toward getting a yellow train arises from issues of speed and goodness not just color. For the child to change the affect, he or she would have to first “disarticulate” these three qualities and then rearticulate them with yellow. This can be difficult because color, speed and goodness can also be articulated with gender, community standing, propriety and so forth. Others and experience can contest the articulation, but without understanding the connections that are at stake for the child, we cannot understand the defensiveness, resistance, or mere passive acquiesce nor the child using arguments of “exceptionalism” or confirmation biases to hold on to the old articulation. These qualities are present in every aspect of the operational phase.

4.2 The complexity of change as rearticulation

Change is a complex process. Allow me to work through an example closer to safety culture. Where I live in Colorado, snowboarding is very popular but can be fairly dangerous. Wearing helmets is an important way to prevent head injuries, but snowboarders tended to avoid wearing them. Knowledge-based safety campaigns have not been very effective and, in fact, may have lead to less usage.

This makes sense if we think of the set of articulations of a snowboard community. “Danger gives me a rush and pleasure.” “Snowboarders are free and independent and violate social rules.” “Snowboarders are different.” “Helmets are worn by skiers, parents and older people.” “You can only be young for a while.” Snowboarders changed to wearing helmets only as the community developed outrageous and even offensive fabric covers for helmets. We could say that they made helmets “cool” or changed cultures, but explanations like this do not get us much. Understanding the set of
rearticulations where nothing is lost in the other rationalities gets us much further in understanding how changes like this occur.

Obviously, rearticulating “safety culture” with company performance or even “safety culture” with concepts related to issue like masculinity and justice in a particular community can be complex. But such a concept, I believe, helps us to start attending to the right things. The concept shows why and how multiple rationalities have to be considered; it helps identify the sites of resistance in the way that changes in one rationality challenges others; and it gives specifics to concepts like “leveraging” aspects of existing cultures.

What we might call the learned capacities (their mindfulness) and incapacities (their ignore-ance) of communities to attend to some things and not others does not take a long unlearning and re-learning process rather it take a generative transformation. Core to this is membership and identification with different communities and the possibility of integrative and supportive co-articulations rather than competitive ones. These most often require active participation and creativity, qualities that are often lacking in cultural intervention processes.

4.3 The importance of collaboration in change

Understanding the complex system of articulations highlights why and how sustainable change only occurs with the active collaboration of the groups changing. Frequently when change is brought from the outside the consequences to other rationalities is not considered, other forms of human rationality are belittled, and/or these hinged relations remain invisible and cannot be brought to respectful discussion and openly explored. The acceptable of the rationalities that are being threatened through respecting an existing articulation is the beginning of inventing rearticulations that are neither compromises nor losses of key aspect of people and their communities.

Legitimacy and internalization comes from involvement in creation. High-performance organizations require a culture of participation where management functions differently and decisions and responsibility are diffused in the organization. [7] Wider participation in creating a culture of participation may seem obvious but is often not the case. Management direction alone of cultural change or of participation and empowerment rarely succeeds.

4.4 Moving the conversation forward

Let me bring this into the careful work IAEA has already done. Safety culture is defined as “The assembly of characteristics and attitudes in organizations and individuals which establishes that, as an
overriding priority, *protection and safety issues* receive attention warranted by their significance” [2, p.14, italics in the original]. And culture is defined as “a dynamic concept that encompasses everything that happens in an organization. It affects what people do, what they think and how they make sense of events and information—it is a collective understanding of reality” (p. 14). These conceptions direct the intervention strategies and to some extent set up the tension between “safety culture” and presumed deficient national and organization cultural characteristics. “Safety culture enhancement requires sustained effort that should focus on leveraging strengths within the existing culture and changing aspect that inhibit safety rather than attempting to change the basic fabric of the culture…” [2, p.2]

The view I have been developing keeps the holistic intent but takes away the causal power of culture and focuses on the internal dynamics of the impact. This view argues that culture can not be understood outside of the concrete aspects of life and answers to life questions which differ greatly across regions. The detail of this cannot be reduced to national culture. And, safety cannot be transformed through knowledge rationality without evoking the sense of risk and loss in other aspects of life because other configurations are articulated with it.

Individuals can easily feel that their identity, understandings of the way the world works, and justice are challenged in even very smart revisions to monitoring and general building practices. And, individuals will often protect their identity at physical costs to themselves and others. Thus, articulatory relations must be taken seriously and reformation must be inclusive and holistic. This does not say that work practices, etc., cannot be changed, simply that the change must be worked out in articulatory relationships rather than added on or treated as one aspect.

Such an understanding moves away from a model of outside intervention to a concrete and detailed understanding of interactional designs and processes take can help overcome closure to new relational configurations as industrial needs and risks change and work openly with people and companies in specific contexts to rearticulate things like identities, emotions, and institutions in ways that are true to self-determination within the new context. This, I believe, can greatly enrich IAEA model of open spaces.

5.0 ON HERDING CATS:

**THE COLLABORATIVE VISION, ALIGN, INVENT, ACT, ADJUST CYCLE**

Most often cultural management is attempted because of experienced limits to managing effectively in any other way. One way to think of managing culture is through the metaphor of “herding cats.” Management in professionalized workplaces is often characterized as trying to herding cats. The
popularity of the “herding cats” metaphor in professional workplaces arises from the frustration of
directing professionals’ behavior because of their independence and the difficulty of surveillance of
their work, characteristics shared with nuclear power plant operation.

I grew up on a dairy farm and the metaphoric characterization never made much sense to me. Cats are
not hard to herd, just have milk. Cats are only hard to herd if you treat them like sheep and cows. Cats may walk by themselves, but they all quickly independently choose to walk in the same direction following the pail of milk. Culture is like the milk, it pulls people into the future rather than pushes them. When we think of it as a co-constructed enablement rather than a given constraint we begin to lead more effectively.

Here at the end, I want to briefly sketch an interaction design for “cat herding.” This provides a way for multiple stakeholders with different goals and cultural formations to produce integrated and coordinated, what I called, articulations to advance safety as a part of achieving other objectives. A full interaction design helps us decide who should be part of which conversations when and helps us stay out of bad conversations for the sake of better ones.

If we are to better manage the human side of culture and include much more direct collaborative participation of all stakeholders from policy makers and contractors to communities and workers, we need powerful designs for successful conversations, otherwise we simply have more meetings. The IAEA has catalogued many design approaches. I want to move away from these as methods and techniques and highlight the purpose they are to serve. I will briefly present a simplified form modelled on those of Conversant [8]. I propose a vision, align, invent, act, adjust cycle as one way to think about how to have better conversations.

5.1 Vision

Many meetings start with a focus on problems; in fact many are called because of perceived problems. But discussions focused on problems tend to not get very far. Many reasons exist for this and most have been carefully described by people working with Appreciative Inquiry. Collaborative interaction aims at outcome talk rather than problem talk. Every statement of a problem has a hidden positive shadow. This shadow is the hopes, dreams and desires that are not being fulfilled. These are the group’s visions, the outcomes sought that are hidden by the talk of about problems. Groups develop in the direction of the questions they address. Many explanations and blame create threat and defensiveness. Embracing people’s hopes and dreams opens spaces for integrative rearticulations. We begin by asking where people want to go. Almost all successful models focus on the achievement of safety rather than the prevention of accidents. [8]
5.2 Align

Aligning visions into concrete choices of action requires accepting that people not only have purposes that must be accepted and made explicit but they also carry in concerns about and understandings of their specific circumstances. Focusing on the articulations helps us understand these relations. Accepting a new circumstance, policy or procedure has consequences across dimensions of human experience. For example, we might reasonable ask in any change context not just what does this circumstance ask you to do, but what does it ask you to be. No deep cultural change is possible without accounting for feelings, beauty and justice. Aligning these is not the job of the individual in their private spaces, it is the job of us all in public spaces.

5.3 Invent

Focusing on joint invention starts for a recognition that the best idea and course of action is not carried into the room but arises there. Not recognizing this often leads cultural change to be manipulation rather than invention and greatly reduces legitimacy, commitment and compliance. Invention puts creativity as the most central issue in safety discussions. The goal is develop a desirable (that it is accepted and seen as beneficial by all stakeholders), feasible (it could actually be put in place), and viable (that is it sustainable over time) path forward that rearticulates across rationalities. Good invention requires getting multiple forms of expertise in the room and respecting them. Individuals at the point of production often have low status but have understandings than cannot easily be represented by others. Good design enables all expertise to be consequential.

5.4 Act

Action is often seen as a choice put into play by leaders. I believe that it is more useful to see action as distributed and put into play by many actors. Sometimes this is treated “empowerment.” But I think such a word glosses much. Empowerment without commitment, understand the whole, and good information is shallow. One of the forces that lead Total Quality Management to enact changes in production processes in Japan in the 50s and 60s was the ability to wed information sharing, individual responsibility, and collective identification.

5.5 Adjust
Continuous improvement requires that actions are open to constant open assessment without fear. This includes revisiting the purposes and desired outcomes that put it in place, identifying what has worked well and what not, determining the actionable lessons, and deciding what will be done differently. In each of these is an opportunity to show how safety is integrated into the process of planning and work.
REFERENCES


