



Intelligent Organizational Systems

... Aligning Meaning, Propensities, and Systems

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Canadian Nuclear Safety Commission
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Re: Comments on Feedback for DIS-12-07, Safety Culture for Nuclear Licensees

We wish to comment on the feedback received on DIS-12-07, Safety Culture for Nuclear Licensees. Over the past several years our organization has contributed to numerous IAEA technical meetings and initiatives on SC, including SC training, assessments, and development of three SC guidance documents for Pre-Operational Phases, Continual Improvement, and Self-assessment of SC. During our work we observed three common features of current approaches to SC:

1. In brief, current approaches to nuclear SC focus on leadership, communication, setting and reinforcing expectations, SC assessments, SC enhancement programs, and preventive and corrective action plans. This approach has not led to significant safety improvements but has often led to in-house situations where supervision or field workers are assigned blame for events. In the case of external assessments by regulators or INPO/WANO blame is typically assigned to management.
2. Very few nuclear organizations approach culture from a systemic view based on an understanding of the interactions between the human system (including organizational design and functionality), management system processes, and technology. These elements are all manifestations of culture, and focusing only on one dimension of the human system, namely leadership, supervision, and workers, misses the opportunity to leverage all elements of the system to improve safety consciousness and safety itself. For example, if management only considers the organization structure as a way to assign responsibilities and authorities, and management system processes as a way to control the work of others, they may overlook both the cultural impact of their decisions in these areas, and potential opportunities to leverage systems to improve safety.
3. The nuclear industry rarely applies innovative methods that foster genuine engagement of staff in developing and improving integrated systems, and often promotes outdated approaches to human psychology (e.g., antecedent-behaviour-consequence mental models). In general, nuclear cultures often consider innovation as a risk to consistency, conformity and reliability.

Innovative approaches are desirable, possible and beneficial, but based on reviewer comments, we wonder whether some of the responding organizations have a somewhat restricted definition of innovation.

Our specific comments reflect our general impressions above:

1. We agree with the industry and the IAEA's general view that culture cannot be regulated mechanistically or be mandated programmatically in a one-size-fits-all approach. We also agree that Appendix C may be too prescriptive/limited in its current form. Nonetheless, we also believe that regulators do have a responsibility to provide independent oversight of safety culture, and can do so effectively by taking a more systemic view of the overall organization. One aspect is to ensure that each licensee has an effective (graded) oversight process in place that includes organizational/behavioural expertise, and acts systemically on identified SC issues.
2. In North America and Western Europe, there is a reasonably common understanding of safety culture language and terminology within nuclear organizations. There is no universal agreement on how to assess safety culture or use findings to reliably enhance safety performance, and within the industry itself there is heavy reliance on expectations promulgated by INPO and WANO. There is little to distinguish IAEA, INPO, WANO, NRC and other approaches (e.g., the airline industry) in terms of the fundamentals of safety culture. Nuances in definitions, characteristics, and language have little to do with the root issues and efforts at refinement are of marginal value in the North American/Western European context. [For example, the IAEA definition includes "protection" to acknowledge the importance of safeguards, and although the INPO/NRC definition only mentions safety, one could hardly imagine they don't include safeguards in their concept of safety.] Rather than refine terms and characteristics as a "check-list" for programs and assessments, the focus should be on finding out what can be done in practical terms to enhance safety consciousness within a specific organizational culture, and what innovative levers exist beyond what is currently done in the industry.
3. We do not agree with reviewer comments that adding someone with knowledge of "human performance fundamentals" to a SC assessment team is merely an "asset". It is extremely difficult for a culture to "see" itself, particularly a relatively homogenous culture as exists within the nuclear industry. Hence we believe it is essential (even for self-assessments) to include behavioural and organizational science expertise, preferably from outside the organization. The team should include a mix of people who understand all levels and functions of the organization very well, and people who understand behavioural and organizational science very well (i.e., not a token representative who has taken human performance fundamentals training based on INPO/WANO methodologies). Our many interactions with behavioural and organizational experts have made it clear that their point of view adds considerable insight beyond current nuclear models of culture. Although several reviewers point out that the IAEA draft states that such expertise is important for the review of results, it is rather gratuitous to suggest that this is adequate. One reason that industry managers have difficulty acting on the results of SC assessments is that a fundamentally different way of thinking is required both to assess and to influence culture. A SC action plan with a traditional corrective action approach that ensures the action is closable misses the dynamic nature of culture and culture change. Such plans are further weakened by the fact that behavioural and organizational experts are rarely engaged in their development. The industry needs to step outside its current find-and-fix models to a more strategic, proactive, and innovative approach to the role of culture in safety performance. This

includes revisiting linear notions of applying continual improvement models based on plan-do-check-act concepts to more complex issues related to culture change.

In many organizations, safety culture is unfortunately still a bolt-on people-focused program similar to traditional safety programs that once focused on safety training and enforcement rather than integrated “safety management” systems. We need to take a broader view and ask what levers in the integrated system (human system, management system processes, technology, and operating context including external environment, etc.) can be used to improve safety culture and safety performance. Being more innovative in our approach and discovering what works well in engaging cultures to embrace improvement would seem more productive than fine-tuning current methods which INPO has stated have not led to significant safety improvements or “engaged, thinking organizations”.

It is well known that the safety culture of the regulatory body itself can have a positive or negative effect on licensees, and efforts by the CNSC to clarify the Canadian context are commendable. While some reviewer comments raise valid issues, we also note some collective positioning that may not be conducive to advancing the common goal of promoting healthy safety cultures in all organizations.

Safety culture is a learning journey for all parties, and we agree with respondents who suggested a joint meeting between the CNSC and key stakeholders. We would in fact make some suggestions regarding the content of such a joint working meeting:

- Presentations by key organizations on how they systemically and systematically integrate safety culture into their human system (including organizational design and functionality), management system processes, technology, and operating context; and their intentions related to safety culture enhancement. Rather than reference common industry practices, the presentations should focus on practices that their organization considers innovative (i.e., go beyond current nuclear industry practices) and are also specific to their organizational culture.
- A “creative” or “open space” forum involving all participants to identify innovative approaches that are worth exploring in practice.
- An “open space” forum that examines what oversight means in action for regulators overseeing licensees, and licensees overseeing their internal operations. This could form the basis of generic requirements for safety culture within the Canadian nuclear industry.

Finally, we suggest inviting, as full participants, experts in human and organizational behaviour both within and external to the nuclear industry, including international experts. We would be happy to suggest some names on request.

Respectfully submitted by,



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