



NUCLEAR ENERGY INSTITUTE

Douglas J. Walters  
SENIOR DIRECTOR  
NEW PLANT DEPLOYMENT  
NUCLEAR GENERATION DIVISION

August 19, 2009

Mr. Glenn Tracy  
Director  
Division of Construction Inspection and Operational Programs  
Office of New Reactors  
U.S. Nuclear Regulatory Commission  
Washington, DC 20555-0001

**Subject:** Comments on July 23 Draft Proposed Safety Culture Components for Construction

**Project Number: 689**

Dear Mr. Tracy:

In a public meeting on July 23, 2009, the NRC staff provided a handout presenting draft safety culture components and aspects for new plant construction. As described by the staff, the draft safety culture components were adapted from the thirteen components that the NRC now uses in the Reactor Oversight Process (ROP). We provided initial feedback in the meeting. We have now had the opportunity to review the document more thoroughly, and detailed comments are enclosed.

Our overarching concern is the significant differences in focus between the nuclear safety culture of an operating plant and a construction site. These differences need to be addressed on a more fundamental level than simply modifying the operating plant safety culture components. While we understand the staff has taken this approach as a stopgap measure, to support near-term Construction Inspection Program implementation (January 2010), a focused effort is required to determine the essential elements of a strong construction safety culture.

During a May 27 Commission briefing on safety culture, the potential need to define safety culture and its elements differently for different licensee activities was recognized. We believe this same approach applies to construction and can be achieved through meetings of industry, the NRC and other interested stakeholders. This effort should involve persons with expertise and experience in construction management and a behavioral science. We propose that this effort be undertaken in parallel with related work to flesh out the Construction Inspection Assessment Process (CIAP) between now and the end of 2010 such that the CIAP, including well-founded safety culture assessment elements, would be in place to support new plant construction inspection going forward.

Mr. Glenn Tracy  
August 19, 2009  
Page 2

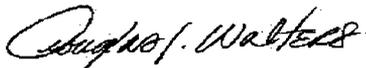
We believe such an effort will yield a robust common understanding of what constitutes a strong construction safety culture. This will allow licensees and their agents to implement adequate training and oversight to ensure such a culture exists.

Recognizing the near-term need expressed by the staff and plans to initially use construction safety culture components adapted from the ROP, we offer the following general comments on the NRC's July 23 handout:

- Since there is no fuel on-site during most of construction, it is unclear what aspects of safety are being addressed. Our recommendation is to place emphasis on construction quality consistent with the overriding priority appropriately identified by the staff.
- Notwithstanding the fact that the licensee is responsible for activities authorized by the NRC, several components need to reflect that they apply to the licensee and its agents, or to the agents with the licensee's oversight.
- Some of the components lack clear examples and/or appear to be redundant to elements discussed in other components. For example, we recommend deleting Continuous Learning Environment and Organizational Change Management from the set of safety culture components for construction.
- We do not believe the components capture the importance of the workforce understanding its roles and responsibilities in construction quality and also understanding appropriate interactions with the quality organization.

We look forward to discussing safety culture assessment further with the staff, including both interim components to support initial CIP implementation, and a more construction-focused set of components for use over the long term. If you have any questions, please contact Tom Houghton (tch@nei.org; 202-739-8107), Russ Bell (rjb@nei.org; 202-739-8087) or me.

Sincerely,



Douglas J. Walters

Enclosure

c: Ms. Joelle Starefos, U.S. Nuclear Regulatory Commission

# Handout for July 23, 2009 Public Meeting Safety Culture Topic – NEI Comments 8/19/09

## Draft revision of Safety Culture Components and Aspects from the ROP (modified for construction)

### 1. **Decision-Making - Licensee and/or its agent (hereafter "licensee/agent") decisions demonstrate that construction quality is an overriding priority. Specifically (as applicable):**

- (a) The licensee/agent makes decisions related to construction quality that reflect the potential to impact ITAAC (closure or affect on already closed ITAAC) using a systematic process to ensure construction quality is maintained.

For example if a safety-related part could not be purchased as EQ, was the commercially obtained part properly dedicated and was the evaluation process adequate?

Unexpected construction conditions or test results are properly reviewed for potential impact on ITAAC.

Authority and roles for evaluating these decisions are formally defined and communicated to applicable personnel including contractors and subcontractors.

Interdisciplinary input and review are attained on decisions that relate to more than one discipline.

Design decisions are not made at the site, but are communicated back to by the design authority (e.g. Engineering Procurement Contractor or Design Center) in accordance with approved design control procedures.

- (b) The licensee/agent uses conservative assumptions in decision-making and adopts a requirement to demonstrate that the proposed construction activity does not adversely impact construction quality or ITAAC closure. The licensee/agent conducts effectiveness reviews (e.g., self assessments or audits) of these decisions to verify the validity of the underlying assumptions, identify possible unintended consequences, and determine how to improve future decisions.

For example, when making decisions related to testing, individuals ensure that they are on the correct unit and question the validity of their underlying assumptions, identify possible unintended consequences, and obtain appropriate management involvement and/or interdisciplinary input and reviews.

**Comment [A1]:** This seems like a procedure adherence (design change control) issue rather than decision-making issue.

**Comment [A2]:** In some cases, design decisions may be made at the site. Emphasis should be on following approved design change procedures to protect approved design.

**Comment [A3]:** It is not clear what is meant by "conservative assumptions" in the construction context vs. operating reactor context.

## Handout for July 23, 2009 Public Meeting Safety Culture Topic – NEI Comments 8/19/09

- (c) The licensee/agent communicates decisions and the basis for decisions, in a timely manner, to personnel who have a need to know the information in order to perform work properly.

### 2. Resources - The licensee/agent ensures that personnel, equipment, procedures, and other resources are available and adequate to assure construction quality. Specifically, those necessary for:

- (a) Training of personnel and sufficient qualified personnel to maintain work hours within working hour guidelines. Licensee ensures an adequate number of supervisors to ensure proper field oversight.

The licensee ensures that contractor and licensee staffs have required training and qualifications applicable nuclear construction experience. Managers ensure that personnel have sufficient understanding of all nuclear-related codes/ standards/ requirements applicable to their job functions and are qualified to perform the assigned tasks.

Training is developed and implemented to ensure technical competency and reinforces that quality and safety is of the highest priority. Management encourages individuals to develop and maintain current their required professional and technical knowledge, skills, and abilities and ensures knowledge transfer.

- (b) Complete, accurate and up-to-date design documentation (field drawings), procedures, and work packages, and correct labeling of components.
- (c) Adequate and available facilities and equipment, including temporary construction structures. Simulator fidelity supports effective training and is consistent with final plant fabrication.

### 3. Work Control - The licensee/agent plans and coordinates work activities, consistent with ensuring construction quality. Specifically (as applicable):

- (a) The licensee/agent appropriately plans construction activities by addressing:
- the potential to impact quality (CAQ/SCAQ)
  - job site conditions, including environmental conditions which may impact human performance; previously/concurrently built structures, systems, and components; human-system interface; or radiological safety; and
  - abort criteria to prevent inadvertent equipment damage, either to equipment being operated or connected systems

**Comment [A4]:** Fatigue rule does not apply to construction site until fuel is loaded. Second sentence is redundant to 4c.

**Comment [A5]:** We will have many people without nuclear construction experience.

**Comment [A6]:** Change is consistent with emphasis throughout this document on construction quality as the overriding priority.

**Comment [A7]:** As written, this appears to apply to all individuals on site, including craft, and a highly transient workforce. Expectations in this area are not clear and need to be discussed.

**Comment [A8]:** Simulator fidelity is not a safety culture/resource issue; it is a requirement of the Training Program.

**Comment [A9]:** In the construction phase this could only apply to radiography???

## Handout for July 23, 2009 Public Meeting Safety Culture Topic – NEI Comments 8/19/09

- (b) The licensee/agent appropriately coordinates work activities by incorporating actions to address:
- The impact of changes to the work scope or other planned construction activities and human performance.
  - The impact of the work on different job activities, and the need for work groups to maintain interfaces with offsite organizations, and communicate, coordinate, and cooperate with each other during activities in which interdepartmental or multiple vendor coordination is necessary to assure human performance,
  - The need to keep personnel apprised of construction work status that may affect work activities,
  - Communication and coordination is maintained among on-site vendors, contractors, licensee personnel, and site support staff to minimize schedule pressure. The NRC resident inspectors are informed of schedule changes relevant to the oversight process

Comment [A10]: Not clear what this means

#### 4. Work Practices - Personnel work practices support human performance. Specifically (as applicable):

- (a) The licensee/agent communicates human error prevention techniques, such as holding pre-job briefings, self and peer checking, and proper documentation of activities. These techniques are used commensurate with the potential to impact construction quality for the assigned task, such that work activities are performed safely in a quality manner with appropriate attention to detail.

Comment [A11]: Seems to imply industrial safety. In the safety culture context, licensee focus should be on construction quality.

Individuals encourage and reinforce quality related principles, attitudes, and behaviors in their interactions with co-workers by, for example, questioning perceived unsafe or non-conservative decisions and behaviors, and holding one another accountable for the quality of their work products and safe performance of work activities.

Comment [A12]: It is not clear what is meant by "non-conservative" in the construction context vs. operating reactor context.

Personnel are fit for duty.

Comment [A13]: Again, to what extent is industrial safety to be covered in this document??

In addition, personnel do not proceed in the face of uncertainty or unexpected circumstances.

Comment [A14]: Split this out from fit for duty. It is a different aspect.

- (b) The licensee/agent defines and effectively communicates expectations regarding procedural compliance and personnel follow procedures and work instructions.

## Handout for July 23, 2009 Public Meeting Safety Culture Topic – NEI Comments 8/19/09

- (c) The licensee/agent ensures supervisory and management oversight of work activities, including contractors, such that construction quality is supported.
5. **Corrective Action Program – The licensee/agent ensures that issues potentially impacting construction quality are promptly identified, fully evaluated, and that actions are taken to address construction quality concerns in a timely manner, commensurate with their significance. Specifically (as applicable):**
- (a) The licensee/agent implements a corrective action program with an ~~low appropriate~~ threshold for identifying issues. They licensee identifies such issues completely, accurately, and in a timely manner commensurate with their impact on ~~construction quality assurance~~.
- (b) The licensee/agent periodically trends and assesses information from the CAP and other assessments in the aggregate to identify programmatic and common cause problems ~~(especially among various work groups, contractors, and vendors)~~. They licensee communicates the results of the trending to applicable personnel (internally and externally).
- (c) The licensee/agent thoroughly evaluates problems such that the resolutions address causes and extent of conditions, as necessary including properly classifying conditions adverse to quality. This also includes, for significant problems, conducting effectiveness reviews of corrective actions to ensure that the problems are resolved. Classifying of events should include review for impact to ITAAC conclusions or reliability assumptions used in the plant-specific Design Reliability Assurance Program (DRAP).
- (d) The licensee/agent takes appropriate corrective actions to address construction quality issues and adverse trends in a timely manner, commensurate with their significance (CAQ/SCAQ), complexity, and ability to impact ongoing construction activities.
- (e) If an alternative process (i.e., a process for raising concerns that is an alternate to the licensee's corrective action program or line management) for raising ~~safety construction quality~~ concerns exists, then it results in appropriate and timely resolutions of identified problems.
6. **Construction Experience - The licensee/agent uses construction experience (Con E) information, including vendor recommendations and internally generated lessons learned, to ensure construction quality. Specifically (as applicable):**

**Comment [A15]:** Construction specifications, procedures and work instructions may define how to correct low threshold items without entering the CAP.

**Comment [A16]:** Delete parenthetical consistent with ROP. Trending is case specific; this is not the place to provide guidance on trending.

Handout for July 23, 2009 Public Meeting  
Safety Culture Topic – NEI Comments 8/19/09

- (a) The licensee/agent systematically collects, evaluates, and communicates to affected internal stakeholders in a timely manner relevant internal and external Con E.
- (b) The licensee/agent implements and institutionalizes Con E through changes to construction processes, procedures, materials, and training programs.

**7. Self and Independent Assessments – The licensee/agent conducts self- and independent assessments of their activities and practices, as appropriate, to assess performance and identify areas for improvement. Specifically (as applicable):**

- (a) The licensee/agent conducts self-assessments at an appropriate frequency; such assessments are of sufficient depth, are comprehensive, are appropriately objective, and are self-critical. The licensee periodically assesses the effectiveness of oversight groups and programs such as CAP and policies.
- (b) The licensee/agent tracks and trends safety and construction quality indicators, which provide an accurate representation of performance.
- (c) The licensee/agent coordinates and communicates results from assessments to affected personnel, and takes corrective actions to address issues commensurate with their significance.

**8. Environment for Raising Concerns - An environment exists in which employees feel free to raise concerns both to their management and/or the NRC without fear of retaliation and employees are encouraged to raise such concerns. Specifically (as applicable):**

- (a) Behaviors and interactions of licensee personnel, contractors, subcontractors, and vendors encourage free flow of information related to raising construction quality concerns, differing professional opinions, and identifying issues in the CAP and through self-assessments. Such behaviors include supervisors responding to employee safety concerns in an open, honest, and non-defensive manner and providing complete, accurate, and forthright information to oversight, audit, and regulatory organizations. Past behaviors, actions, or interactions that may reasonably discourage the raising of such issues are actively mitigated. As a result, personnel freely and openly communicate in a clear manner conditions or behaviors, such as fitness for duty issues that may impact quality, and personnel raise construction quality issues without fear of retaliation.

## Handout for July 23, 2009 Public Meeting Safety Culture Topic – NEI Comments 8/19/09

- (b) If ~~an~~ alternative processes (i.e., ~~a~~ processes for raising concerns or resolving differing professional opinions that are alternates to the licensee/licensee/agent's corrective action program or line management) for raising concerns or resolving differing professional opinions exists, then ~~they~~ the alternate processes are communicated to all, are accessible to all, have an option to raise issues in confidence, and are independent, in the sense that the program does not report to line management (i.e., those who would in the normal course of activities be responsible for addressing the issue raised).

### **9. Preventing, Detecting, and Mitigating Perceptions of Retaliation – A policy for prohibiting harassment and retaliation for raising construction quality concerns exists and is consistently enforced in that:**

- (a) All personnel are effectively trained that harassment and retaliation for raising construction quality concerns is a violation of law and policy and will not be tolerated.
- (b) Claims of discrimination are investigated consistent with the content of the regulations regarding employee protection and any necessary corrective actions are taken in a timely manner, including actions to mitigate any potential chilling effect on others due to the personnel action under investigation.
- (c) The potential chilling effects of disciplinary actions and other potentially adverse personnel actions (e.g., reductions, outsourcing, and reorganizations) are considered and compensatory actions are taken when appropriate.

### **10. Accountability - Management defines the line of authority and responsibility for construction quality. Specifically (as applicable):**

- (a) Accountability is maintained for significant quality assurance decisions in that the system of rewards and sanctions is aligned with construction quality and reinforces behaviors and outcomes, which reflect construction quality as an overriding priority.
- (b) Management reinforces quality assurance standards and displays behaviors that reflect construction quality as an overriding priority.
- (c) The workforce demonstrates a proper construction quality focus and reinforces quality assurance principles among their peers.

### **11. ~~Continuous Learning Environment – The licensee ensures that a learning environment exists. Specifically (as applicable):~~**

**Comment [A17]:** This component, for a construction site and its transient craft population seems inappropriate. The training is contained in the resource component. It is also redundant to the Con E component. Recommend dropping.

## Handout for July 23, 2009 Public Meeting Safety Culture Topic – NEI Comments 8/19/09

(a) ~~The licensee provides adequate training and knowledge transfer to all personnel on site as required to ensure technical competency.~~

(b) ~~Personnel continuously strive to improve their knowledge, skills, and safety performance through activities such as benchmarking, being receptive to feedback, and setting performance goals. The licensee and its agents effectively communicates relevant information learned from internal and external sources about industry and site construction issues.~~

**12. Organizational Change Management – Management uses a systematic process for planning, coordinating, and evaluating major changes in the construction environment. The change management process considers the transitory nature of personnel involved with the construction project and the need to provide strong oversight and leadership. This may be demonstrated by effectively implemented procedures and processes.**

**13. Construction Quality Policies – Construction quality policies and related training establish and reinforce that construction quality is an overriding priority in that:**

(a) Management and supervisors adopt and reinforce, in their interactions with subordinates the approach that a proposed action must be demonstrated to be safe (and maintains construction quality) in order to proceed rather than an approach that a proposed action must be demonstrated unsafe to not maintain construction quality in order to disapprove an action. ~~The systems of rewards and sanctions are aligned with construction quality policies that reinforce behaviors and outcomes, which reflect construction quality as an overriding priority.~~

(b) Senior managers and corporate personnel periodically communicate and reinforce construction quality such that personnel understand that construction quality is of the highest priority.

**Comment [A18]:** This is not applicable at the craft level.

**Comment [A19]:** This seems too vague to rise to the level of a component. The more specific parts are already covered under decision making. Recommend dropping.

**Comment [A20]:** This requires additional work to identify what is needed. For example, craft need to know their role in construction quality and the role of QC and QA, for example in their unfettered access to work and ability to question and stop work.

**Comment [A21]:** This is confusing in the context of a construction site. Are we talking about industrial safety? Maintain focus on quality.

**Comment [A22]:** Redundant to 10 (a).