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David Lochbaum  
Union of Concerned Scientists

TO:

Commission

FOR SIGNATURE OF :

\*\* PRI \*\*

CRC NO: 04-0063

Chairman Diaz

DESC:

Safety Conscious Work Environment - Follow-up  
Enhancements to the Reactor Oversight Process

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# Union of Concerned Scientists

Citizens and Scientists for Environmental Solutions

February 2, 2004

Chairman Nils J. Diaz  
Commissioner Edward McGaffigan, Jr.  
Commissioner Jeffrey S. Merrifield

**SUBJECT: KUDOS AND MEA CULPA ON SAFETY CONSCIOUS WORK ENVIRONMENT**

Dear Chairman and Commissioners:

NRC Region I did nuclear safety a tremendous service by issuing its January 28, 2004, letter to the Chairman of the Board for Public Service Enterprise Group (PSEG) regarding potential safety culture problems at the Salem and Hope Creek nuclear plants. The true value of this NRC action may best be reflected by an equally commendable NRC Region III decision in December 2003 delaying the restart of the Davis-Besse nuclear plant in Ohio based largely on its inadequate safety culture. Collectively, these two NRC decisions made me realize that my decision on safety conscious work environment rulemaking was wrong, twice.

The Davis-Besse nuclear plant has been shut down for nearly two years while its owner repaired degraded safety equipment and the poor safety culture that caused them. The extensive equipment problems have now been remedied. Restoration of a proper safety culture remains a work in progress. The two-year-plus effort to restore safety culture shows just how far below acceptable it had fallen. NRC Region III did the right thing by not allowing Davis-Besse to restart with reservations about the safety culture.

NRC Region I did an even righter thing by not waiting for the safety culture at Salem and Hope Creek to decline to the point where months and years were necessary to restore it. There is compelling evidence the safety culture at Salem and Hope Creek is declining. For example, the number of allegations received by the NRC from plant workers soared in the past two years and the NRC's own inspections documented recurring, uncorrected deficiencies in the problem identification and corrective action program. NRC Region I took the prudent, pre-exemptive step of requiring PSEG to evaluate the safety culture at Salem and Hope Creek and outline its plans to stop the troubling trends.

NRC Region I's action is even more remarkable given the vacuum they must function in – a vacuum which I accept partial responsibility for creating. In 1997 and again in 2002, I strongly opposed the NRC staff's proposals for safety conscious work environment rulemaking. I was wrong both times – not because safety conscious work environment rulemaking was necessary, but because I failed to advocate what should be done to address the underlying problem. By merely opposing the NRC staff's proposal, I unintentionally accepted the *status quo*. Davis-Besse is the latest example demonstrating why the *status quo* is unacceptable. Safety culture is too closely linked to safety margins to let it erode unchecked to the depths reached at Davis-Besse and Millstone. And yet the reactor oversight process, which I helped develop, provides no meaningful guidance to the regions on how and when to intervene for a drooping

safety culture. The reactor oversight process lamely hand-waves at the thorny subject by labeling safety culture a "cross-cutting issue." The bulk of the guidance assists the regions monitor the restoration of a bad safety culture, as Region III is now doing at Davis-Besse. There is insufficient guidance within the reactor oversight process to consistently trigger NRC engagement in a timely fashion so as to prevent such safety culture debacles. Within the current reactor oversight process:

*Safety culture "can be characterized by a willingness on the part of licensee staff to raise and document safety issues to resolve risk-significant equipment and process deficiencies promptly, adhere to written procedures, conduct effective training, make conservative decisions, and conduct probing self-assessments."*

and

*"Possible indications of an "unhealthy" safety culture include a high number of allegations, a weak employee concerns program, and a high corrective maintenance backlog."<sup>1</sup>*

NRC Region I was seeing all these unhealthy safety culture indications, and more, at Salem and Hope Creek. But the reactor oversight process gave them little means to handle the warning signs:

*"Specifically, if a licensee had a poor [safety culture], problems and events would continue to occur at that facility to the point where either they would result in exceeding thresholds for various PIs [performance indicators], or they would be surfaced during NRC baseline inspection activities, or both."*

and

*"In short, no separate and distinct assessment of licensee safety culture is needed because it is subsumed by either the PI's or baseline inspection activities."<sup>2</sup>*

Davis-Besse had all GREEN performance indicators and NRC inspections findings when the pineapple-sized cavity in its reactor vessel head was finally discovered. Only then did its extremely unhealthy safety culture 'suddenly' reveal itself. In fact, the safety culture did not get that bad that quickly. It eroded over a long period of time, unmonitored and uncontrolled by the reactor oversight process. So, assessment of safety culture is not subsumed in the reactor oversight process, it is submerged so deeply that it cannot see what is evident. In that respect, the reactor oversight process is as deficient as NASA's process for dealing, or not dealing, with known foam strikes during launches until the *Columbia* disaster.

The designers of the reactor oversight process, which includes me, did NRC Region I (or Region III in the Davis-Besse case) no justice by giving them no useful tools to oversee safety culture. Faced with that vacuum, NRC Region I blazed a new trail and created the means to deal with disturbing signals. Some may criticize them for acting too hastily or too heavy-handedly. Others may criticize them for acting too belatedly or too meekly. But the fact remains that NRC Region I acted responsibly to deal with troubling nuclear safety signs. Their action was every bit as warranted as the action by NRC Region III to delay restart until safety culture at Davis-Besse exceeded a defined threshold.

In parallel with NRC Region I's commendable efforts to ensure a good safety culture at Salem and Hope Creek, there must be an effort to upgrade the reactor oversight process to provide better definition to help the regions oversee safety culture. Perhaps the best way to develop that definition would be to replicate the public workshop conducted by the NRC staff in late September/early October 1997 that culminated in the draft reactor oversight process, but on a smaller scale. That process would bring NRC staff and stakeholders together to identify the key elements (cornerstones, if you will) needed for a good safety culture. That process would then identify what performance indicators and inspections are needed to

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<sup>1</sup> Nuclear Regulatory Commission, NRC Inspection Manual, Manual Chapter 0308, "Reactor Oversight Process (ROP) Basis Document," February 21, 2003, page 12.

<sup>2</sup> Nuclear Regulatory Commission, NRC Inspection Manual, Manual Chapter 0308, "Reactor Oversight Process (ROP) Basis Document," February 21, 2003.

provide effective oversight of adequate performance in the cornerstone areas.<sup>3</sup> Finally, that process would identify performance thresholds and correlated NRC regulatory responses. I anticipate that this effort would culminate in mostly re-packaging of existing inspection processes with minor additions or revisions rather than wholesale retooling. The foundation materials have been developed. Their focus simply needs to be sharpened.

NRC Region I took an important first step with early intervention on safety culture problems. We thank them for that important first step. We urge the Commission to direct its staff to join with stakeholders on the much needed follow-up enhancements to the reactor oversight process.

Sincerely,



David Lochbaum  
Nuclear Safety Engineer

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<sup>3</sup> The process might identify an attribute within a cornerstone not covered under existing regulations. If so, that would be the trigger for specific rulemaking.