

Safety Culture is not Possible Without Regulatory Compliance



Indian Point aerial photo by author June 2010

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Overview

Nuclear professionals, members of the public, Congress, Non-Government Organizations (NGOs), and concerned non-industry stakeholders agree on one issue: **nuclear plant safety is paramount and must be the number one priority**. However, the actions, and inactions, of the Nuclear Regulatory Commission (NRC), Nuclear Energy Institute (NEI), and nuclear plant owners, have led to financial considerations taking priority over nuclear safety. The current focus on nuclear safety via what the industry and its regulator call “safety culture,” unless redefined and clarified, is a dead end. To truly achieve nuclear safety, “regulatory compliance and enforcement ” must be the frame used to gauge Nuclear Safety Culture.

This paper provides my unique perspective on the nuclear “Safety Culture” and regulatory compliance, based on what I have observed during more than 45 years working in the nuclear industry. The reality is clear. The NRC and nuclear industry are focused on “Safety Culture” as a primary contributor to nuclear safety, ignoring the actual issue: that NRC has neither identified nor enforced, and licensees have not complied with NRC regulations.

My perspective¹ is based on more than 25 years of engineering and management experience at Northeast Utilities (NU), Millstone and Connecticut Yankee, where I identified major safety/compliance issues, and received harsh retaliatory actions. The NRC failed to take any actions to stem the steady decline of the Safety Culture and regulatory compliance, resulting in the near destruction of Northeast Utilities and the permanent closure of Millstone 1 and Connecticut Yankee. While at these facilities I first hand knowledge of a poor safety culture² and witnessed the impact of regulatory failures.

The shortest (or surest) path to nuclear safety³ is achieved by compliance with NRC regulations⁴. The only means of assuring compliance is with consistent enforcement.

¹ For those not familiar with of my background, I started as a “White Hat” in the Nuclear Navy in 1964. I was an instructor at one of the Navy Nuclear Prototypes (SIC) and then went to serve as Lead Petty Officer for Reactor Controls division on a nuclear submarine. I received my BSEE degree in 1972.

After graduating, I worked for Northeast Utilities from 1972 to 1993 as Supervisor of I&C engineering and again from 1997 to 2001 as a consultant and ombudsman assisting the recovery of what was left of Millstone and Northeast Utilities, the final years attempting to establish as Safety Conscious Work Environment (SCWE). I participated in most of the industry’s Employee Concerns Program Forum (ECPF) meetings attempting to understand these complex issues. I worked very closely with the NRC and NEI believing that utility Safety Culture was the root cause of the problem.

I was an expert witness for the plaintiffs in the TMI civil litigation and an expert witness for the New York State Attorney General related to the relicensing of Indian Point Units #2 and #3. I was a consultant to Maine Yankee and Indian Point attempting to resolve Safety Culture and SCWE issues.

² My perspective as used here is that safety culture includes regulatory compliance and enforcement.

³ What is nuclear safety? Like beauty, it can sometimes be in the eyes of the beholders. To settle debates among beholders, nuclear safety is defined as compliance with NRC regulations. Otherwise, nuclear safety would be chaotic subjectivity over questions like whether two or three backup pumps constituted proper safety. Because compliance with NRC regulations is the recognized answer key for such questions, compliance with NRC regulations simply must be the foundation for Nuclear Safety Culture as defined in the NRC’s Inspection Manual 9900.

Documents from the NRC⁵, Licensee Event Reports (LERs⁶), the White House Memoranda⁷, accident reports⁸, near miss reports⁹, ASLB opinions¹⁰, and Inspector General Investigations¹¹ (OIG) support my observations. They show that we cannot operate nuclear power plants safely until the regulations are clearly identified and enforced. In recent decades, that simply has not been done.

International Safety Culture

Safety Culture in the nuclear industry originated from the Chernobyl accident in April 1986. Safety culture was first defined in various International Atomic Energy Agency (IAEA) documents.¹²

INSAG-4 safety culture was defined as:

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

This definition does not specifically discuss regulatory compliance; however, the three cited IAEA/INSAG documents clearly discuss the role of the regulator, regulatory compliance and enforcement as a key ingredient in a sound safety culture. Some of the supporting statements from the IAEA documents include:

- ***“In conformity with its views as expressed in INSAG-4, INSAG now confirms the view that safety culture had not been properly instilled in nuclear power plants in the USSR prior to the Chernobyl accident. Many of its requirements seem to have existed in regulations, but these were not enforced. [Emphasis added]”***

⁴ <http://www.nrc.gov/reading-rm/doc-collections/cfr/>

⁵ <http://www.nrc.gov/reading-rm/doc-collections/insp-manual/technical-guidance/tg-operation-safety.pdf>

⁶ <https://lersearch.inl.gov/LERSearchCriteria.aspx>

⁷ <http://www.whitehouse.gov/the-press-office/2011/01/18/presidential-memoranda-regulatory-compliance>

⁸ <http://www.nrc.gov/reactors/operating/ops-experience/vessel-head-degradation/lessons-learned/11tf-report.html>

⁹ UCS's 2013 report for 2012: http://www.ucsusa.org/assets/documents/nuclear_power/NRC-nuclear-safety-2012-report.pdf;

UCS's 2012 report for 2011: http://www.ucsusa.org/assets/documents/nuclear_power/nrc-nuclear-safety-2011-full-report.pdf;

UCS's 2011 report for 2010: http://www.ucsusa.org/assets/documents/nuclear_power/nrc-2010-full-report.pdf

¹⁰ <http://adamswebsearch2.nrc.gov/webSearch2/main.jsp?AccessionNumber='ML082130414'>

¹¹ <http://www.nrc.gov/reading-rm/doc-collections/insp-gen/2003/02-03s.pdf>

¹² IAEA/INSAG 15: http://www-pub.iaea.org/MTCD/publications/PDF/Pub1137_scr.pdf
IAEA/INSAG 7: http://www-pub.iaea.org/MTCD/publications/PDF/Pub913e_web.pdf
IAEA/INSAG 4: http://www-pub.iaea.org/MTCD/publications/PDF/Pub882_web.pdf

- “The accident can be said to have flowed from deficient safety culture, not only at the Chernobyl plant, but throughout the Soviet design, operating and **regulatory organizations** [Emphasis added] for nuclear power that existed at the time.”
- “An assessment of the Chernobyl accident in this respect demonstrates that a deficit in safety culture was inherent not only to the stage of operation, but also and to no lesser extent to activities at other stages in the lifetime of nuclear power plants (including design, engineering, construction, manufacture and **regulation**) [Emphasis added].”
- A plant which fell well short of the **safety standards in effect when it was designed**, [Emphasis added] and even incorporated unsafe features;
- Inadequate understanding by operators of the safety aspects of their plant;
- An insufficiently **effective regulatory regime** [Emphasis added] that was unable to counter pressures for production;
- If the Chernobyl accident is assessed in terms of this safety culture concept, it can be seen that not only those involved in the operational stage lacked an adequate safety culture, but also those involved in other stages of the lifetime of a nuclear power plant (**designers, engineers, constructors, equipment manufacturers, ministerial and regulatory bodies, etc.**) [Emphasis added].
- **Safety is compliance driven and is based mainly on rules and regulations.** [Emphasis added] At this stage, safety is seen as a technical issue, whereby compliance with externally imposed rules and regulations is considered adequate for safety.
- Do employees understand and accept the **need for the rules** and, in particular, do they understand the potential consequences, in terms of effects on safety and the environment, **arising from non-compliance?** [Emphasis added]
- Shortcuts or failures to **follow requirements** [Emphasis added] should not be condoned, even when there are strong operational pressures to do so.
- The assurance of safety in the face of the inevitable pressures to meet production goals requires a dedicated operating organization and a strong and **independent regulatory regime, properly resourced, backed at Government level and with all necessary enforcement powers.** [Emphasis added]
- **INSAG is informed that the regulatory regime was ineffective** [Emphasis added] in many important areas, such as analysing the safety of the design and operation of plants, in requirements for training and for the introduction and promotion of safety culture, and in the **enforcement of regulations** [Emphasis added]. It did not function as an independent component in ensuring safety.

- *“The accident occurred as a result of bringing the reactor to a state which did not **conform to the operating regulations** [Emphasis added].*
- *A **regulatory body has a weighty influence on the safety of nuclear plants** [Emphasis added] within its purview and an effective Safety Culture pervades its own organization and its staff.*
- *Regulators recognize that the primary responsibility for safety rests with the operating organization and not the regulator. To this purpose, they ensure that **regulatory requirements are clear** [Emphasis added] but not so prescriptive as to set undue constraints*

I elected to highlight only those areas of the IAEA documents that address the roles of the regulator and the understanding of the applicable regulations however, there are many aspects of these three IAEA documents that are necessary for a worthy safety culture.

United States Safety Culture

Recently issued Institute of Nuclear Power Operations (INPO) guidance¹³ on Safety Culture takes a completely different path from the IAEA documents to nuclear safety culture, and does not even mention regulatory compliance/enforcement or the responsibility of the regulator.

It is very interesting to note that not member of the general public or those of us with first hand experience with Safety Culture and SCWE were included as members or contributors to these INPO documents.

INPO’s definition of *Nuclear Safety Culture* from INPO 12-012:

*“Nuclear Safety Culture is defined as the core values and behaviors resulting from a collective commitment by leaders and individuals to **emphasize safety over competing goals** [Emphasis added] to ensure protection of people and the environment.”*

INPO 12-012 goes on to state:

*“All individuals take personal responsibility for safety. Responsibility and authority for nuclear safety are **well defined and clearly understood** [Emphasis added]. Reporting relationships, positional authority, and team responsibilities emphasize the overriding importance of nuclear safety.*

*Individuals understand the importance of **adherence to nuclear standards** [Emphasis added]. All levels of the organization exercise accountability for shortfalls in meeting standards.”*

13 <http://nuclearsafety.info/wp-content/uploads/2010/07/Traits-of-a-Healthy-Nuclear-Safety-Culture-INPO-12-012-rev.1-Apr2013.pdf>

The term “standards” is used 15 times in the INPO document, without ever defining these “standards.” INPO fails to even hint that regulatory compliance may be a possible contributing factor to the degradation of Safety Culture. The word “compliance” is not even mentioned in this INPO document except for describing the position of one of the contributors.

Without crystal clear and consistent regulations and enforcement, and a full understanding of both regulatory requirements and NRC “guidance,” simply endorsing a “*collective commitment by leaders and individuals to emphasize safety over competing goals to ensure protection of people and the environment*” is essentially meaningless within INPO’s definition of safety culture. Except in hindsight, no one at INPO, at NRC, or within the nuclear industry would have said that this “collective commitment” was lacking at Millstone in the mid 1990s or at Davis-Besse a few years later. Since this approach would not have prevented or mitigated past problems, how can it prevent ones in the future?

I discussed INPO 12-012 with the INPO representatives, NRC contributors, present and retired NRC personnel, shift supervisors and four contributors to this INPO document. Not one person was able to clearly articulate the meaning of “nuclear standards” as applied to this document. I received opinions including “I don’t know,” “Technical Specifications and procedures,” “ASME, IEEE, EPA, OSHA and ANS standards,” and “whatever is established and written by the nuclear site.” “Collective commitment” with each person having a different roadmap is as successful as a choir with each member singing a different song. It is essential that the nuclear choir be singing from the same page in the same book.

One INPO representative stated that INPO concentrates on “Excellence” and not compliance with NRC regulations. It might assist the readers of these documents if INPO would also define “excellence” as it applies to the commercial nuclear industry.

Only one person stated that “nuclear standards” included compliance with NRC Regulations.

The NRC’s Safety Culture Policy Statement¹⁴ defines Safety Culture as:

“The Commission defines Nuclear Safety Culture as the core values and behaviors resulting from a collective commitment by leaders and individuals to emphasize safety over competing goals to ensure protection of people and the environment.”

While the three definitions are very similar the supporting guidance between these documents is very different. There are significant differences from the international (IAEA) guidance and the safety culture guidance from the NRC and INPO.

INPO and the NRC use the words “safety,” “standards” and “excellence,” but they avoid mentioning any requirements for regulatory compliance. The NRC’s and INPO’s failures to identify and enforce its regulations, the common denominator for most nuclear accidents and near misses, are the very foundation of Nuclear Safety and safety culture, and are yet totally ignored.

¹⁴ <http://www.gpo.gov/fdsys/pkg/FR-2011-06-14/pdf/2011-14656.pdf>

Rather, I strongly suspect that one core problem is that the NRC and the power plant licensees are unable, and unwilling, to do the work that is necessary to identify the regulations that are applicable to a particular nuclear plant.

The INPO guidance document¹⁵ continues the fallacy by implying that culture was a major contributor to the events of Chernobyl, Three Mile Island, Davis-Besse, and Fukushima:

*“A theme common in these events is that, over time, problems crept in, often related to or a direct result of the plant **culture**. Had these problems been recognized, challenged, and resolved, the events could have been prevented or their severity lessened. The series of decisions and actions that resulted in these events can usually be traced to the shared assumptions, values, and beliefs of the organization.*

*These events and the notion that **culture** is a key ingredient in the overall success of the plant form the basis for this document.”*

An inadequate “Safety Culture” may be symptom, but it ignores the real cause. We continue to spend millions of dollars following “safety culture,” while ignoring the real problem—the identification and consistent enforcement of regulations.

As presently defined by the NRC and INPO, safety culture is nearly impossible to measure and totally subjective. If safety culture was based on compliance to well defined regulations it should be measurable.

The omission of regulations and regulatory compliance by INPO and the NRC in their definitions and discussions of Safety Culture was a not a simple oversight. I believe that both INPO and the NRC fully appreciate the potential impact on the nuclear industry if regulatory identification and compliance was required.

Supporting documents and studies

INPO states that many of the more significant nuclear events were the result of a failure of the Safety Culture. My review of significant events, and other nuclear mishaps indicates the major cause of each is the failure to comply with established regulations and not the failure of safety culture as presently defined. This fundamental regulatory failure is the common denominator of numerous reports, studies, investigations by the NRC, General Accountability Office (GAO), Davis Besse LLTF¹⁶, Maine Yankee Independent Safety Assessment Team (ISAT), NRC’s Inspector General, and the Kemeny Commission¹⁷ report on Three Mile Island (TMI). The Kemeny Commission¹⁸ and the

¹⁵ <http://nuclearsafety.info/wp-content/uploads/2010/07/Traits-of-a-Healthy-Nuclear-Safety-Culture-INPO-12-012-rev.1-Apr2013.pdf>

¹⁶ <http://www.nrc.gov/reactors/operating/ops-experience/vessel-head-degradation/lessons-learned/lltf-report.html>

¹⁷ <http://www.threemileisland.org/downloads/188.pdf>

Rogovin report¹⁹ on TMI didn't even mention the word "culture." The factual reason for these events was that these licensees failed to comply with the regulations while the NRC looked the other way.

Had the NRC identified and enforced its regulations, we never would have experienced the mishaps of Millstone, Three Mile Island, Davis Besse²⁰ and possibly other events such as the Browns Ferry fire, containment failure at Crystal River, and the loss of many careers due to NRC failures. The permanent shutdown of Crystal River, San Onofre²¹, Yankee Rowe, Millstone 1, Connecticut Yankee, and Maine Yankee²² may have been avoided had the NRC identified and consistently enforced its regulations. Or possibly these plants would have been closed earlier had they been required to comply with regulatory requirements.

The NRC's own LER (Licensee Event Report) search link²³ clearly shows that Safety Culture is not an issue impacting nuclear safety. This NRC database contains more than 35,000 LERs discussing events at licensee facilities. A search for "compliance" returns more than 11,000 hits. A search for "safety culture" returns only 32 hits. The majority of these safety culture hits discusses plans for safety culture training; lack of "safety culture" training has not been, a contributing factor for any event. As presently defined by the NRC and INPO, safety culture does not appear to be a problem based upon more than 35,000 LERs.

Over the past three years the Union of Concerned Scientists (UCS) has reported²⁴ 43 "Near Misses" at commercial nuclear plants. None were attributed to a poor "Safety Culture." Thirty-five "near misses" were attributed to failure to comply with NRC regulations.

The White House Presidential Memoranda of January 18, 2011 recognized the vital tie between safety and compliance with regulations:

"Sound regulatory enforcement promotes the welfare of Americans in many ways, by increasing public safety, improving working conditions, and protecting the air we

¹⁹ <http://www.threemileisland.org/downloads/354.pdf>

²⁰ <http://www.nrc.gov/reactors/operating/ops-experience/vessel-head-degradation/lessons-learned/ltf-report.html>

²¹ <http://www.nrc.gov/info-finder/reactor/songs/ML12188A748.pdf>

²² <http://www.nrc.gov/reading-rm/doc-collections/insp-gen/1998/97-03s.pdf>
<http://www.nrc.gov/reading-rm/doc-collections/news/1997/97-018i.html>

²³ <https://lersearch.inl.gov/LERSearchCriteria.aspx>

²⁴ http://www.ucsusa.org/assets/documents/nuclear_power/NRC-nuclear-safety-2012-report.pdf
UCS's 2013 report for 2012:
http://www.ucsusa.org/assets/documents/nuclear_power/nrc-nuclear-safety-2011-full-report.pdf
UCS's 2012 report for 2011:
http://www.ucsusa.org/assets/documents/nuclear_power/nrc-2010-full-report.pdf
UCS's 2011 report for 2010:

*breathe and the water we drink. **Consistent regulatory enforcement** [Emphasis added] also levels the playing field among regulated entities, ensuring that those that fail to comply with the law do not have an unfair advantage over their law-abiding competitors. Greater agency disclosure of compliance and enforcement data will provide Americans with information they need to make informed decisions. Such disclosure can lead the Government to hold itself more accountable, encouraging agencies to identify and address enforcement gaps.”*

The NRC Inspection Manual 9900²⁵ agrees that compliance and nuclear safety are intertwined:

*“Safety is the fundamental regulatory objective, and **compliance with NRC requirements** [Emphasis added] plays a fundamental role in giving the NRC confidence that safety is being maintained. NRC requirements, including technical specifications, other license conditions, orders, and regulations, have been designed to ensure adequate protection—which corresponds to “no undue risk to public health and safety”—through acceptable design, construction, operation, maintenance, modification, and quality assurance measures. In the context of risk-informed regulation, compliance plays a very important role in ensuring that key assumptions used in underlying risk and engineering analyses remain valid.”*

The converse of this is true in that the public cannot be assured that there is “no undue risk to public health and safety” unless the regulations are clearly identified and enforced.

The NRC’s own words directly link safety and compliance yet ignores this relationship when discussing safety culture.

Unfortunately, the NRC has not followed either the President’s memoranda or its own statements. It has not required industry to operate today’s reactors to “Protect[ing] people and the Environment²⁶,” from the effects of radiation, or to avoid and minimize the social and economic consequences²⁷ of a reactor accident²⁸.

For what appear to be financial and production reasons the NRC and nuclear industry are intentionally heading in the wrong direction by attributing many events, near misses and accidents to “Safety Culture,” and ignoring that the true cause is the industry’s failure to identify and comply with the NRC regulations of 10 CFR.

²⁵ <http://www.nrc.gov/reading-rm/doc-collections/insp-manual/technical-guidance/tg-operation-safety.pdf>

²⁶ <http://www.nrc.gov/>

²⁷ <http://www.reuters.com/article/2013/02/07/us-france-nuclear-disaster-cost-idUSBRE91603X20130207>

²⁸ Recent studies from Japan and France indicate that a major reactor accident may result in consequences that are a significant portion of the country’s GDP. A major accident at Indian Point would have similar consequences to the US economy.

Current Licensing Basis

The Current Licensing Basis²⁹ “is the set of NRC requirements applicable to a specific plant and a licensee’s written commitments for ensuring compliance with and operation within applicable NRC requirements and the plant-specific design basis.”

In 1992 the NRC issued Generic Letter 92-003³⁰. This letter is titled “Compilation of the Current Licensing Basis: Request For Voluntary Participation in Pilot Program.” This letter solicited “the industry’s participation in a **voluntary** [Emphasis added] pilot program to assess the advantages and disadvantages of compiling the current licensing basis.” I am not aware that any licensee “volunteered” for this program. This is further evidence that twenty years later, the NRC still has no clue of the CLB for any plant.

Working as an expert witness for the State of New York I wrote a letter³¹ (ML0711840433) to the NRC requesting the identification of the regulations applicable (CLB) to all three Indian Point reactors.

I requested the NRC to:

*“ . . .provide me with a listing of those regulations contained within 10 CFR that are **applicable** [Emphasis added] to the design, construction and operation of the three reactors located on the Indian Point site with specific emphasis on the requirements of 10 CFR 20, 50 and 100 and all appendices.”*

The NRC responded (ML071980412) and stated:

*“As you may know, an operating nuclear power plant is subject to various requirements in 10 CFR Part 50 as well as the provisions of numerous other regulations. The Indian Point facility is and will be required to remain in compliance with all **applicable requirements** [Emphasis added] of 10 CFR Part 50 and other **applicable regulations (except as exempted)** [Emphasis added] during its current*

²⁹ § 54.3 Definitions.

(a) As used in this part,

Current licensing basis (CLB) is the set of NRC requirements applicable to a specific plant and a licensee's written commitments for ensuring compliance with and operation within applicable NRC requirements and the plant-specific design basis (including all modifications and additions to such commitments over the life of the license) that are docketed and in effect. The CLB includes the NRC regulations contained in 10 CFR parts 2, 19, 20, 21, 26, 30, 40, 50, 51, 52, 54, 55, 70, 72, 73, 100 and appendices thereto; orders; license conditions; exemptions; and technical specifications. It also includes the plant-specific design-basis information defined in 10 CFR 50.2 as documented in the most recent final safety analysis report (FSAR) as required by 10 CFR 50.71 and the licensee's commitments remaining in effect that were made in docketed licensing correspondence such as licensee responses to NRC bulletins, generic letters, and enforcement actions, as well as licensee commitments documented in NRC safety evaluations or licensee event reports.

³⁰ <http://www.nrc.gov/reading-rm/doc-collections/gen-comm/gen-letters/1992/gl92003.html>

³¹ Numerous requests have been made to the NRC to identify the Current Licensing Basis as defined in 10 CFR 54.3 and the NRC has never been able to produce a copy of the CLB for any plant. The NRC’s Office of the Inspector General has been formally requested to evaluate this significant issue.

<http://adamswebsearch2.nrc.gov/webSearch2/main.jsp?AccessionNumber='ML073400187'>

<http://adamswebsearch2.nrc.gov/webSearch2/main.jsp?AccessionNumber='ML071840433'>

<http://adamswebsearch2.nrc.gov/webSearch2/main.jsp?AccessionNumber='ML071980412'>

operating term as well as the period of extended operation, if a renewed license is issued.

*Regarding your request for a listing of **regulations applicable** [Emphasis added] to the design, construction and operation of the three reactors located on the Indian Point site, such information can be found in a variety of documents, including but not limited to orders, license conditions, exemptions, technical specifications, licensing correspondence, and the most recently updated final safety analysis report for a specific facility. In general, you can also find the principal parts of the NRC regulations applicable to each specific type of license on our NRC website at <http://www.nrc.gov/about-nrc/regulatory/rulemaking/access-regs.html>.”*

I very well know the regulations but what I don't know is what regulations are applicable where. This NRC response confirms that I am not alone in my ignorance.

The State of New York in its opposition to the relicensing on Indian Point³² contended that neither the NRC nor the licensee have been able to identify the CLB for Indian Point. 10 CFR 54 (Relicensing) requires:

“(3) For each structure and component identified in paragraph (a)(1) of this section, demonstrate that the effects of aging will be adequately managed so that the intended function(s) will be maintained consistent with the CLB for the period of extended operation.

(b) CLB changes during NRC review of the application. Each year following submittal of the license renewal application and at least 3 months before scheduled completion of the NRC review, an amendment to the renewal application must be submitted that identifies any change to the CLB of the facility that materially affects the contents of the license renewal application, including the FSAR supplement.”

The Atomic Safety and Licensing Board rejected this contention³³ as not within the ASLB's authority, but in a footnote it recognized that the NRC's inability to compile and make available the CLB for a plant was inconsistent with any assurance that the NRC is adequately managing a facility:

“We find it troubling that in today's electronic age it is not possible for petitioners to get onto the NRC's public site or the ADAMS document management system and find the CLB for each plant clearly laid out in a folder with hyperlinks to each separate document. If the NRC must compile this information to continually monitor the compliance of a facility with the regulations, then presumably someone has already done so. If the CLB has not been compiled in one easy to access location, how can the public be assured that the NRC is adequately monitoring the facility? We believe that in the thirteen years since the last revisions to the Final Rule on License Renewal technology has advanced to a point where it would be possible for the NRC to make this

³² <http://adamswebsearch2.nrc.gov/webSearch2/main.jsp?AccessionNumber='ML073400187'>

³³ <http://adamswebsearch2.nrc.gov/webSearch2/main.jsp?AccessionNumber='ML082130436'>

information available to the public. This simple act would foster a level of transparency that would be very helpful in the license renewal process.”

The simple fact of the matter is that the NRC has been unable, reluctant, unwilling and certainly unenthusiastic, to make the CLB for an operating plant available to the public or even its own employees and Resident Inspectors. How can anyone require compliance with “set of NRC requirements applicable to a specific plant” if those regulations are unknown and intentionally hidden from NRC inspectors and the public?

One of the clearest examples of misunderstanding of NRC regulations is the manner in which a licensee has supposedly complied with 10 CFR 50, Appendix A “General Design Criteria”³⁴. The Commission has determined via SECY 92-223³⁵, that these vital General Design Criteria (10 CFR 50 Appendix A) are not applicable to more than half of the operating plants in the United States, yet many licensees are not even aware of this interpretation. There is also the question if the Commission has the authority to negate regulations without the formal rulemaking process.

Proper regulatory oversight is essential not only to reform bad actors but also to sustain good ones. A licensee’s behaviors can’t be changed unless there are significant consequences for failure to comply with the rules. Only the NRC has this authority. Does the NRC impose sufficient penalties to deter further violations and consistently enforce unspecified regulations?

A clear example is the Millstone debacle. Many employees and service providers lived through Millstone’s downfall and recovery (1988-2000). While Millstone had a “safety culture” and a Safety Conscious Work Environment (SCWE) problem, the crisis was the direct result of the NRC’s failure to enforce its regulations. Millstone failed to comply with the regulations. The NRC took no significant action until the Millstone story appeared on the cover of Time Magazine³⁶.

The NRC has a clear role - clearly identify and enforce the regulations. Yet neither the role nor the responsibilities of the NRC leadership is discussed in the INPO safety culture documents. INPO fails to mention the obligation of its licensee members to adhere to their commitments to comply with license requirements (CLB).

No organization other than the NRC, possibly with the assistance of INPO, NEI, IAEA and pressure from Congress can resolve this issue. No one within the nuclear industry will dare admit that the “Emperor (NRC) has no clothes” or that the NRC itself is the primary factor inhibiting the establishment of a true “Safety Culture” by failing to require regulatory compliance.

³⁴ There are three different versions of the GDCs. The first is a draft copy published in the Federal Register (circa 1967). The second is a set of comments by the Atomic Industrial Forum (NEI predecessor) and the final GDC that are published as 10 CFR 50 Appendix A (circa 1971).

³⁵ <http://pbadupws.nrc.gov/docs/ML1225/ML12256B290.pdf>

³⁶ <http://www.time.com/time/magazine/article/0,9171,135575,00.html>

Personal Experience with Safety Culture and Compliance

I was a consultant on Safety Conscious Work Environment (SCWE) issues at Millstone, Indian Point and Maine Yankee, and have provided consulting services to EPRI, NEI and a majority of Chief Nuclear Officers in the US Nuclear Industry.

During my years at Millstone, I identified major safety/compliance issues and saw an NRC that sadly failed to take any action to stem the steady decline of any meaningful Safety Culture and regulatory compliance, resulting in the near destruction of Northeast Utilities and the permanent closure of Millstone 1 and Connecticut Yankee.

I also received harsh retaliatory action for identifying major safety issues clearly violating NRC regulations. I am one of many whose careers were permanently changed because the NRC failed to enforce 10 CFR especially 10 CFR 50.7 (Employee Protection) and Appendix B and other regulations defined in 10 CFR. I became a “high profile whistleblower”, and recipient of substantiated retaliation, not only from my management but also from the NRC itself³⁷ as a direct result of raising safety concerns that the NRC did not want to “see.” Many other dedicated licensee employees have lost their careers, livelihoods and families doing what they were instructed to do: to identify safety issues to management or to the NRC.

During the 1990s I truly believed “Safety Culture and SCWE” were only a utility problem and could be solved by the utilities. After reading about many events and working with whistleblowers from both within the industry and the NRC, and working with many organizations attempting to address Safety Culture, I have come to the conclusion that this is a problem that cannot and will not be solved by the industry unless the NRC and INPO fulfill their role as part of the leadership of the industry and demand regulatory compliance.

I also witnessed the Davis Besse³⁸ head failure and other significant nuclear events that may or may not have been a result of a “Safety Culture” problem. I’m convinced that Millstone debacle (1989-2001) and Davis Besse (2001-2003) were failures that would have been avoided had the NRC had promptly and consistently enforced its regulations.

We also witnessed the Browns Ferry fire, TMI meltdown³⁹, Connecticut Yankee reactor cavity seal failure⁴⁰, and the most recent announcement of the closure of San Onofre

³⁷ I was cited (Severity level IV) by the NRC for violating 10 CFR 50, Appendix B within months of identifying a major safety issue affecting every BWR in the world. I was retaliated against by NU from 1988 to 1993. Almost five years later in May 1993 the NRC imposed a \$100,000 civil penalty for violating 10 CFR 50.7 “Employee Protection.”

³⁸ In 2004 I developed a presentation for the 2004 annual ANS conference. This presentation was titled “Safety Culture: Root cause or Symptom.” The conclusion of my presentation was that the real cause of this near miss was that First Energy failed to comply with NRC regulations the NRC took no action.

³⁹ I was an expert witness for some of the civil litigation related to the TMI meltdown and had access to all documents related to the accident. This accident could have been prevented had the NRC required TMI to resolve previously identified events.

⁴⁰ <http://www.nrc.gov/reading-rm/doc-collections/gen-comm/bulletins/1984/b184003.html>

Units 2&3 and Vermont Yankee. I firmly believe a lack of regulatory enforcement contributed to the significance of these events.

I have unique first hand knowledge that in the Millstone debacle and that the failure of the NRC to consistently enforce its regulations led to a degraded Safety Culture and SCWE and was a major contributing factor, to the downfall of Millstone and Northeast Utilities⁴¹. Davis-Besse and TMI were similar however; I had no first-hand knowledge but reviewed almost every report and investigation of these events and come to the same conclusion that lack of regulatory enforcement resulted in a degraded “Safety Culture.”

Production before Safety

After more than 25 years at Northeast Utilities and Millstone I think everyone and every organization is missing the real cause of what is being commonly referred to as a Safety Culture problem. I was personally involved in some of technical issues that resulted in the near destruction of Northeast Utilities and the loss of Millstone Unit 1 and Connecticut Yankee. The cost to shareholders and ratepayers probably exceeded \$2 billion dollars not to mention the careers of many people at NU from the Chairman of the Board all the way down to my level as Engineering Supervisor and subordinates and almost every nuclear executive in between.

In the late 1980s NU had a significant number of complaints of discrimination at Millstone. These were valid safety concerns brought to the NRC and to Millstone management. At that time, I believed that both the NRC’s and NU’s primary focus was on nuclear safety. It took many years for me to realize that safety is not the primary focus of the NRC or Northeast Utilities management. At Millstone the bottom line and cost containment were the priorities.

The Rosemont transmitter failure and BWR reactor level measurement failures are two examples that led me to the above conclusion. If space and time permitted, I could provide many other examples of instances of failure of the NRC to enforce its regulations that eventually led to a degradation of Safety Culture at Millstone and the entire industry.

Rosemont Transmitter Failure

During 1988, while working under contract to EPRI, with NU’s full knowledge and permission we discovered that a significant percentage of Rosemont safety related pressure and differential transmitters were failing. These devices had been inoperable for months and possibly years and went undetected. The failure was that control room indicators would indicate normal flow; however, when the reactor coolant pumps were tripped, it would take hours for flow to indicate the actual flow of zero. I reported these failures to NU management and was directed to work with NUMARC (NEI.)

These undetected failures would have inhibited reactor trips upon loss of RCS flow and Steam Generator pressure and level indication. The failure had not been detected until a sophisticated computer analysis developed by EPRI and NU. Five out of 12 RCS flow transmitters failed on Millstone Unit 3 and because of these failures the Rosemont

⁴¹The Strategic Destruction of Northeast Utilities http://papers.ssrn.com/sol3/papers.cfm?abstract_id=270848

transmitters would not have initiated a reactor trip due to loss of flow. NU's Reactor Engineering Department calculated that this event increased core melt frequency by 5,800%. After much prodding the NRC finally issued a Bulletin⁴² informing other utilities of a potential problem but required no immediate action. It took years for licensees to identify and replace all defective safety-related Rosemount transmitters, even though many of these safety related transmitters were not capable of performing their designated function.

Further analysis also determined that many other safety related Rosemount transmitters throughout the nuclear industry were also failing at an alarming rate, potentially impacting the safe operation of many nuclear plants throughout the world.

NUMARC, EPRI and I visited Rosemount in an attempt to identify the problem and encourage them to determine the cause of the problem, resolve it and take any actions to report any regulatory violation⁴³ to the NRC. Rosemount claimed no knowledge⁴⁴ of the problem.

Analysis by EPRI and myself revealed that Rosemount had been aware of the problem but had never reported the problem under the requirements of 10 CFR 21. My personal estimate was that 50% of the Rosemount transmitters were experiencing undetected failures. At the time the NRC headquarters had little or no interest in the problem.

As a direct result of my identifying the Rosemount transmitter problems, Northeast Utilities management told me that I was relieved of any further investigation into the Rosemount failures. I was threatened by management and finally audited by Internal Auditing at the direction of NU's Vice President. Two of my subordinates were suspended for minor time keeping errors⁴⁵.

Against my management's direction, I confidentially reported the issue and my perceived harassment to the NRC's Senior Resident Inspector at Millstone, Mr. William Raymond⁴⁶, one of the few NRC persons willing to pursue this major safety issue. This was the beginning of the downfall of Northeast Utilities.

42 BL-90-01, 03/09/1990, Loss of Fill-Oil in Transmitters Manufactured by Rosemount
BL-90-01s1, 12/22/1992, Loss of Fill-Oil in Transmitters Manufactured by Rosemount

43 Rosemount denied knowledge of this problem and stated it was a "random failure" and not reportable under 10 CFR 21. A subsequent investigation (five years later) the NRC's Office of Investigation (OI) determined that Rosemount acted in "careless disregard" of NRC regulations and the NRC issued Rosemount a Severity Level II violation without any civil penalty and no other sanctions. Rosemount actually benefited from these failure by replacing thousands of transmitters at full cost or above.

44 Many years later the NRC issued Rosemount a Severity Level II violation for careless disregard of 10 CFR 21 (Reporting Defects.) No civil penalty was imposed.

45 The NRC's Office of Investigations eventually substantiated adverse actions and violated 10 CFR 50.7 (Employee Protection.)

46 Bill Raymond (Millstone SRI), like most NRC personnel was an extremely dedicated safety advocate and sometime went against the grain, with great risk to his career. Without Bill's commitment to nuclear safety, I would never have survived my career in the nuclear industry. I probably would have wound up destitute, divorced, and possibly suicidal had it not been for Bill's assistance. Tom Shedlosky (now retired) of the NRC also provided invaluable advice on how to navigate the NRC minefield.

The NRC told me that if I believed retaliation as a result of raising a safety concern I was required to file a claim with the US Department of Labor (DOL). DOL's findings concluded I was harassed for raising a safety issue. Five years later the NRC came to this same conclusion and imposed a violation and civil penalty of \$100,000 against Northeast Utilities, an insignificant civil penalty for a \$4 billion dollar corporation.

BWR reactor level measurement failures⁴⁷

During 1991, I was requested by the NRC to assist the Pilgrim Nuclear plant in the identification of its continued erratic reactor water level indication. I met with Pilgrim and NRC personnel and reviewed Pilgrim's history of level problems that frequently resulted in spurious reactor trips. The problem was common to all independent safety related level channels. After meetings with NRC, GE, EPRI, MIT and other consultants we concluded the problem was caused by non-condensable gas accumulation in the reference legs, and was the result of a GE generic design problem with the level condensate pots. The condensate pots were designed to be at or near reactor temperature; however, due to gas blockage, all condensate pots were at ambient temperature instead of near 500 degrees as initially designed.

Because these condensate pots contained non-condensable gases rather than steam, non-condensable gases were absorbed down the entire length of the reference legs, some distances exceeding 100 feet like well-aged champagne. When pressure was released the reference legs voided themselves.

When reactor pressure was slowly decreased, these gases (hydrogen and oxygen) expanded and expelled cold water from the reference legs. During normal controlled depressurizations at Pilgrim, 2-foot spikes were observed.

In a rapid pressure loss, such as a steamline break or LOCA, all water could be expelled causing level errors of more than 35 feet⁴⁸ on all channels. All redundant gauges may indicate a normal reactor level while the actual level could be 35 feet lower than the indicated level, possibly with unknown core uncovering. This was only my theory.

During July 1992, Millstone Unit 1 was scheduled for a normal controlled shutdown and with the permission of plant personnel we decided confirm or refute my theory. With special computer monitoring equipment, we determined that Millstone experienced the

⁴⁷ NRC Information Notice 92-54, "Level Instrumentation Inaccuracies Caused by Rapid Depressurization,"

NRC Generic Letter 92-004, Dated 08/19/1992, "Resolution of the Issues Related to Reactor Vessel Water Level Instrumentation in BWRs Pursuant to 10 CFR 50.54(f)"

Info Notice 93-027 'Level Instrumentation Inaccuracies Observed During Normal Plant Depressurization.'

NRC Bulletin-93-03 "Resolution of Issues Related to Reactor Vessel Water Level Instrumentation in BWRs"

NRC Information Notice 93-089 "Potential Problems W-BWR Level Instrumentation Backfill Mods"

BWROG report, "Supplementary Information Regarding RPV Water Level Errors due to Noncondensable Gas in Cold Reference Legs of BWRs," to the NRC on May 20, 1993.

NRC Info Notice 92-054 'Level Instrumentation Inaccuracies Caused By Rapid Depressurization.'

Generic Letter 92-04 To All BWR Licensees Of Operating Reactors, Resolution Of Issues, Reactor Vessel Water Level Instrumentation In BWRs Per 10 CFR 50.54(F).

⁴⁸ These errors were confirmed by EPRI laboratory tests

same exact phenomenon, though to a lesser degree. The reference legs were saturated with non-condensable gases present in all BWRs. We determined all reactor water level indicators to be inoperable per the Technical Specifications.

This was reported to the NRC and GE and the NRC finally issued a Bulletin requiring every GE plant to fix the problem within **five** years. Prior to restart of Millstone 1, we could not justify operating the reactor without operable level indication. Millstone elected to fix the problem with a continuous water purge at the bottom of the reference legs. The NRC reviewed this modification and believed it to be a permanent remedy for the problem.

I assumed the total responsibility Millstone 1 level instrument repair and due to the urgency, I was one day late in obtaining a signature on a purchase order to General Electric, thus violating 10 CFR 50 Appendix B. For this I was cited with a Severity Level IV Violation, a rare example of NRC enforcement.

All other plants operated in an unsafe manner for more than five years yet the only violation issued by the NRC was to the individual identifying and fixing the safety problem.

During an August 1992 Commission meeting I requested that the NRC Chairman, Ivan Selin, have the NRC require each GE plant perform an operability determination per the requirement of 10 CFR 50 Appendix B. My request fell on deaf ears and every BWR continued to operate for more than five years with all safety related reactor level systems inoperable. The Chairman and the entire Commission and NRC staff knowingly continued to allow all other BWR's to operate in clear violation of the regulations and plant Technical Specifications. The Commission knew that if they required plants to take this responsible action, all BWR's in the US would have to be shut down until the safety related level instruments were made operable. This is the most flagrant example where the NRC Chairman knowingly permitted 36 reactors to operate in violation of clear regulations thus putting the public at risk for 5 years. This is yet another vivid example of the NRC placing production before safety.

After this meeting I became so frustrated with the NRC Chairman's total and intentional disregard of nuclear safety I was quoted in the Boston Globe⁴⁹ as saying:

"I'm very fearful now there will be a nuclear accident. I never had that fear before," he said in an interview last week in Washington before a special hearing of the Nuclear Regulatory Commission, which was called because of questions he raised publicly about the safety of 37 of the nation's nuclear power plants. Blanch said his fears stem from his experiences with the NRC, which have led him to conclude the commission is more concerned about the economic health of the nuclear industry than about public health and safety.

"I was almost the last person to come around and realize this about the NRC he said. "It's almost like finding out your sister is working in a whorehouse. You don't want to believe it. They are great at providing the illusion of action. They pick on the small points, but when something large comes up they stick their head in the sand."

⁴⁹ Boston Globe, August 2, 1992

The Rosemount failures and the BWR level failures are but two examples of the NRC knowingly ignoring its regulations, leading to my involuntary status as a “whistleblower.”

There are many of other examples of regulatory noncompliance that are documented in various NRC Inspector General (OIG) reports related to Millstone.

- Office of the Inspector General Event Inquiry: NRC Handling of Issues Related to Refueling Operations at Millstone Unit 1⁵⁰
- Office of the Inspector General Event Inquiry: NRC Staff Actions to Address CU-29 Isolation Valve Issue⁵¹
- Office of the Inspector General: NRC Failure to Adequately Regulate - Millstone Unit 1⁵²
- Office of the Inspector General: Public's Concerns with Millstone Independent Corrective Action/Verification Program (ICAVP)⁵³

In addition to the Millstone regulatory noncompliance issues we have also observed the Davis-Besse head degradation, TMI stuck open PORV, containment sumps clogging, fire protection non-compliance, reactor coolant pressure boundary leakage and all the regulatory noncompliance issues dumped into the “black hole” and conveniently titled “Generic Safety Issues.” I will not be surprised that the recently announced closures of Crystal River and San Onofre⁵⁴ will be attributed to failure to comply with NRC regulations.

Both the NRC⁵⁵ and the NRC’s Office of the Inspector General (OIG⁵⁶) issued reports investigating the Davis Besse events. All findings from the OIG report and even from the NRC’s LLTF attribute the event to the NRC’s failure to assure Davis Besse was in compliance with NRC regulations—not Safety Culture.

On September 30, 2002, the Davis Besse LLTF task force reported its findings to a senior management review team, including 51 recommendations for the NRC to take to address factors that contributed to the Davis-Besse event. None of these recommendations even

⁵⁰ <http://www.nrc.gov/reading-rm/doc-collections/insp-gen/1996/96-05s.html>

⁵¹ <http://www.nrc.gov/reading-rm/doc-collections/insp-gen/1996/96-06s.pdf>

⁵² <http://www.nrc.gov/reading-rm/doc-collections/insp-gen/1996/95-077i.html>

⁵³ <http://www.nrc.gov/reading-rm/doc-collections/insp-gen/1998/97-05s.pdf>

⁵⁴ <http://www.time.com/time/magazine/article/0,9171,135575,00.html>

⁵⁵ <http://www.nrc.gov/reactors/operating/ops-experience/vessel-head-degradation/lessons-learned/lessons-learned-files/lltf-rpt-ml022760172.pdf>

⁵⁶ NRC Inspector General Report Case No. 03-02S October 2003

<http://www.nrc.gov/reactors/operating/ops-experience/vessel-head-degradation/lessons-learned/lessons-learned-files/lltf-rpt-ml022760172.pdf>

mentioned Safety Culture yet the industry continues to follow the “red herring” while ignoring the root cause of this and other nuclear events and accidents---the NRC will not identify or consistently enforce its regulations.

The NRC delayed restart of the plant until Davis Besse could demonstrate an adequate Safety Culture. It imposed a similar requirement on Millstone before restart was permitted. But in neither case did it mention Safety Culture as a cause of the near miss.

The Rewards for A Whistleblower

Fortunately, I attracted a lot of attention in the media, US Senate oversight hearings, meetings with NRC Chairpersons, Commission meetings, Office of the Inspector General (OIG), Office of Investigation investigations, Time Magazine cover⁵⁷ story, Wall Street Journal, New York Times, Boston Globe and the Hartford Courant, etc.

Unlike the majority of whistleblowers, I have “survived.” I hope that I have made a contribution to nuclear safety and that I will continue to do so.

Changing the direction of the nuclear industry a small degree has personally rewarded me. Many individuals and organizations have recognized me for example:

- On February 7, 1993 Northeast Utilities “encouraged” me to leave the company with the provision that I never return to the company or any of its subsidiaries.
- Four years later, Northeast hired me for a few months, as a consultant to assist in recovery from its “SCWE failures.” My effort to do so lasted for more than four years.
- Maine Yankee hired me as a consultant to assist with its safety culture problems.
- Indian Point hired me as a consultant to assist with its safety culture problems.
- Expert witness for numerous litigations cases.
- Consultant for the relicensing of Indian Point
- Provided consulting services to EPRI and NEI (NUMARC)
- Named “Whistleblower of the Year” by a Washington Law Firm
- Westinghouse Electric and Control Engineering named me “Engineer of the Year”.
- And finally my biggest “accomplishment” was to cause the NRC (for perhaps the only time) to take prompt enforcement action. It recognized me personally by issuing a Severity Level IV violation⁵⁸ to Northeast Utilities for my failure to obtain a timely signature on a procurement document while repairing the inoperable General Electric BWR level monitoring systems.

The NRC’s personal recognition continued when it attempted to discredit me by stating to the media: “Blanch violated NRC requirements.”

⁵⁷ <http://www.time.com/time/magazine/article/0,9171,135575,00.html>

⁵⁸ This selective enforcement action by the NRC led to the further degradation of the safety culture at Millstone by sending a clear message that there may be significant consequences for identifying safety issues. This was the only enforcement action taken by the NRC even though 36 BWRs continued to operated for five years without reliable reactor level indication or ECCS protection for low reactor level.

In this one rare example of prompt enforcement action, the NRC sent a very clear message with the issuance of this violation—if you raise a significant safety issue, the NRC will watch your every move and one minor deviation from the regulations will result in a personal violation. My cynical view is that this personal violation would provide justification for my for my termination of employment with Northeast Utilities, with the hope that I could never again identify safety problems.

My history is not unique. I am aware of more whistleblowers that have received enforcement actions, been banned from the nuclear industry, and were indicted for felonies, than those that have been vindicated by the NRC.

In 1993 the NRC’s office of the Inspector General reported 609 cases of harassment for persons raising safety concerns to the NRC. Of these 609 cases, only 44 were investigated by OI. Of these 44, only two cases⁵⁹ resulted in sanctions against a utility.

The chances of a utility receiving any enforcement actions for retaliation are about one in 300. The chances of a person raising safety concerns to the NRC and receiving significant sanctions are much higher.

It is a good business decision for a utility to fire a “whistleblower” as the NRC will only take token action in one out of 300 cases.

I have officially contacted⁶⁰ the NRC’s office of Enforcement and it was unable to provide any up to date information related to the number of power reactor discrimination allegations that have been substantiated over the past five years.

Recommendations

The nuclear industry must recognize it will never solve the Safety Culture problem until the NRC takes the following actions.

- The NRC must require all licensees to identify the Current Licensing Basis (CLB) as defined in 10 CFR 54.3(a) and make the CLB readily available to all NRC personnel, licensees and members of the general public. Either the licensee or the NRC can undertake this effort; however, it must be maintained by the NRC. This position is strongly supported by the NRC’s Generic Letter 92-03, the ASLB and the recent White House Memoranda.
- The NRC must demand that a licensee’s Corrective Action Programs do not contain any items identifying regulatory non-compliance.
- Both the NRC and the licensees must conduct training⁶¹ for all personnel such that there is a clear understanding of the CLB and the applicable regulations and

⁵⁹ I was one of the two cases cited by the OIG.

⁶⁰ Email exchange between Paul Blanch and Lisamarie Jarriel dated September 4-6, 2013

⁶¹ Over the years I have had discussions with both present and former NCR inspectors with respect to regulations especially with respect to the applicability of the Final Safety Analysis Reports (FSARs) and the General Design Criteria in 10 CFR 50 Appendix A.

where they can be located for each reactor.

- The NRC and the Licensee should perform an audit of each licensee’s CLB to provide reasonable assurance that the licensees are in compliance with its license. Special attention should be given to the applicability of 10 CFR 50 Appendix A, “General Design Criteria” and open non-compliance items within the licensee’s corrective action programs.
- The NRC must strictly enforce, in a timely manner, all of the regulations applicable to each plant (CLB), especially those that allege retaliation. This is an absolute requirement to assure adequate protection for the public and the environment. If we have consistent enforcement by the NRC, I don’t believe we would be discussing Safety Culture today. Consistent enforcement and compliance at all levels, especially 10 CFR 50.7⁶² and 10 CFR 50 Appendix B are absolutely necessary.
- The NRC must be clear and consistent in its expectations and consequences for regulatory non-compliance. The only way to compel compliance is through enforcement. Utilities only comply with regulations when the cost of compliance is less than the cost of non-compliance. A strong enforcement policy is the key.
- The NRC should consider changing its definition of Nuclear Safety Culture to include the direct link between nuclear safety and regulatory compliance as discussed in IM9900⁶³
- INPO should redirect its efforts to reinforce regulatory compliance rather than the undefined term of “nuclear standards” as the shortest path to nuclear safety. Safety culture without regulatory compliance is meaningless. INPO could fix this problem simply by defining “nuclear standards” to mean compliance with regulatory requirements or the CLB.

Financial impact

The financial impact of compiling the CLB will be trivial, and less than the efforts expended of the studying of “Safety Culture.” It should not be a major effort to assemble the documents defined in 10 CFR 54.3. Licensees must be mandated to comply with the requirements of the CLB and they should be readily available. I believe the NRC has the responsibility and authority to require the clear identification of the CLB. Without a

⁶² The normal process for the NRC, when it receives a claim of retaliation (Violation of 10 CFR 50.7), it does not investigate the allegation. The allegor is directed to file a complaint with the US Department of Labor (DOL) and frequently the NRC does not investigate. I believe this NRC process also contributes to a degraded safety culture.

⁶³ “Safety is the fundamental regulatory objective, and compliance with NRC requirements plays a fundamental role in giving the NRC confidence that safety is being maintained.”

complete understanding of the CLB it is not possible to have consistent regulatory enforcement.

All levels of workers must be able to access the CLB, which may reduce the number of safety concerns to the Employee Concerns Programs and to the NRC. The NRC, as a minimum should reissue NRC Bulletin 92-003 requiring licensees to assemble the CLB. The NRC must maintain the CLB and make it available to all licensee personnel as well as members of the public. Relicensing under 10 CFR 54.21⁶⁴ is not possible without a detailed knowledge of the CLB.

The cost of compiling the CLB will be trivial when compared to the costs already incurred at Millstone, Davis Besse, Three Mile Island, and possibly Crystal River and San Onofre.

The cost of compliance with the CLB may be significant but certainly less than the cost of a “Fukushima” in the United States.

Conclusion

Until we identify and enforce NRC’s regulations we will never be able to achieve any reasonable safety culture or a true SCWE in the commercial nuclear industry.

According to NRC Inspection Manual 9900⁶⁵ the public cannot be assured that there is “no undue risk to public health and safety” unless the regulations are clearly identified and enforced.

With this hindsight and after reviewing most safety culture documents issued by the NRC, INPO, NEI, EPRI, IAEA and spending many weeks participating in workshops and meetings such as the Employee Concerns Program Forums (ECPF), I now understand that we are treating a symptom and ignoring the real cause of the “Safety Culture” problem—the NRC and the Nuclear Industry refuse to identify the applicable regulations and the NRC is reluctant to promptly and consistently enforce its regulations.

If the INPO “Safety Culture” document is to any provide assistance to licensees it would need to be rewritten to acknowledge that we have no idea as to the requirements applicable to any nuclear plant, and recognize that consistent regulatory enforcement is mandatory to provide reasonable assurance to protect the public and the environment.

It is my strongest belief that until the nuclear industry recognizes the direct link between Nuclear Safety, Nuclear Safety Culture, and identification and compliance with NRC Regulations, we will not be able to successfully develop a Nuclear Safety Culture.

Acknowledgements

⁶⁴ <http://www.nrc.gov/reading-rm/doc-collections/cfr/part054/full-text.html#part054-0021>

⁶⁵ <http://www.nrc.gov/reading-rm/doc-collections/insp-manual/technical-guidance/tg-operation-safety.pdf>

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