

December 19, 2008

Dear Sirs,

I am a former NRC employee. I have a degree in nuclear engineering, have held Senior Reactor Operator (SRO) Licenses at both Pressurized Water Reactor and Boiling Water Reactor plants, and have worked in the industry for nearly 30 years. I left the agency approximately 2 years ago, and continue to work in the nuclear power industry (not on projects related to issues that I worked on while at the NRC).

I feel compelled to write a "lessons learned" letter, after what I consider to be an appropriate time away from the agency.

The NRC prides itself in being "one of the best places to work". I must say that I disagree with that statement – that does not mean that I believe that is a bad place to work, but I don't believe that it is one of the best places to work either (and I have worked at a number of companies/locations, so I'm somewhat qualified to make that assessment).

There are some of the items I noticed while at the NRC that I feel need to be brought to your attention.

Recently the OIG published a report indicating that the NRC's performance is "superior". I leafed through this report and noticed that it not once mentioned the cost associated with NRC compliance. This is a fundamental flaw with the system. Throughout our society, performance is defined as the benefit received versus the cost incurred. If cost is not even considered, then performance cannot be truly measured.

I noticed that this attitude and way of thinking was prevalent among most people who worked there – costs associated with internal operations was considered somewhat, but cost of compliance was never considered at all.

As a government agency, the number one constituents are the ratepayers/taxpayers that pay the bill. If you do not look out for their costs, who will? A metaphor I like to use is this: if the Department of Transportation did not consider cost of compliance to safety rules, everyone in the country would be ordered to drive armor-plated vehicles and could not exceed 5 miles per hour.

I saw examples of this in practice while working at the NRC, and continue to hear of examples today though discussions with industry peers and clients. In many cases it is difficult, if not impossible, to show the disregard for cost or undue burden as "government fraud or abuse" or "violations of the Atomic Energy Act of 1954", but they are still very real. I personally know of at least one instance where a nuclear plant was forced to spend millions of dollars modifying their plant for little or no gain in safety. When a technical audit was performed by NRC staff, they "recommended" that the utility spend a couple of million dollars more to better define the performance of the new modification. Understand that there is a tremendous pressure on a nuclear plant to do whatever the NRC "may" want or request, formally or informally. To the

industry, many "recommendations" by the NRC are seen as "requirements, or we (the NRC) will make life difficult for you".

I believe a lot of this attitude and philosophy stems from the structure, operations and actions of the Advisory Committee on Reactor Safeguards (ACRS). The ACRS is made up of a group of people with a deep background in academics and national lab work. They make their livings doing research and testing, and have a vested interest in expanding research in our country. We (NRC staff) used to refer to them, tongue-in-cheek, as the Advisory Committee for "Research Subsidies". They constantly ask for problems to be researched further, admit that they never saw a test they didn't like, and don't seem to care about the costs or benefits. They work in an environment whose function is to expand knowledge for knowledge's sake. Unfortunately, commercial nuclear power plants do not perform this function in our society – they are designed, built and operated with the intent of producing electricity safely at the lowest cost.

There are currently 105 nuclear power plants operating continuously (for all practical purposes) 365 days a year in our country. Who is maintaining the "reactor safeguards" at these facilities? Who are the most knowledgeable, responsible, trained individuals regarding nuclear plant operation? Answer: the NRC licensed Senior Reactor Operators (SRO). Most US nuclear plants require, as part of their operating license (issued by the NRC), that at least one member of the Senior Plant Management hold a current Senior Reactor Operating License. In most cases, their Plant Operations Review Committee (or similar) is required to be chaired by a person with an active SRO, or a person with an SRO is required to meet the committee quorum. So why isn't the chairman, or a lead member, of the NRC Advisory Committee on "Reactor Safeguards" required to be a former SRO license holder? It's kind of like having a person without a drivers license testing your 16 year old, or a highway patrolman enforcing traffic rules without himself having a license, or ever been tested or able to drive the patrol car. Yet this is what we do, every day at the Nuclear Regulatory Commission.

Another example of how this would work at another government agency: A government agency forces a private owner of some real estate to develop the property by building a large state-of-the-art building; without knowing how to physically develop the property or with the ability to manage the property once it was built. The private owner is "required" to spend all the money associated with zoning, preparation, property improvements, construction, etc. Once the building is complete, the government agency seizes the property and new building, but does not need to reimburse the private owner. This is what the NRC and ACRS does constantly – it forces the industry to do research, with little or no regard to the cost or necessity of the research, then it takes the results of the research, and doesn't reimburse the industry for it.

The big problem is – follow the money – the industry is not the final payer for the research, they pass all of those costs on to the ratepayer/taxpayer.

To show this in another way, see the chart below:

### Limit and Margin Definitions

Limit Notes	Limits	Margins	Margin Notes
	Failure Point/Ultimate Capability		
NRC controlled	Regulatory Limit	FP/UC uncertainty	Unusable Margin
NRC approved limit, AL may or may not be mechanistic	Acceptance Limit	Margin of Safety	NRC controlled, need regulatory approval to manage
ADL may not exist for all parameters - assume ADL = AL	Analyzed Design Limit	Regulatory Margin	Not defined, described in 4.1
	Operating Limit	Design Margin	May be an undefined if an ADL doesn't exist - assume DM = RM
		Operating Margin	
	Normal Operating Band		

**Notes:**

1. AL and ADL may be the same, or different.
2. AL may be greater than or less than ADL
3. OL, ADL, AL, RL may have low or high uncertainty (i.e. lines could be "thin" or "thick") - not applicable for this project

While employed at the NRC, I worked on Generic Safety Issue GSI-191. During that time, I believe that I had established a reasonable approach for establishing a "reasonable assurance" Acceptance Limit for evaluation of Downstream Effects in Reactor Fuel. "Reasonable Assurance" is the regulatory safety requirement. This approach was reviewed by technical peers at the agency and by technical peers in industry, and considered acceptable. When presented to the ACRS, all they cared about was the uncertainties of the Acceptance Limit and Regulatory Limit (i.e. how "thick" the lines were); without taking into context the Margin of Safety or FP/UC uncertainty. I hear now that the approach developed is being disregarded, and the industry is being "recommended" into performing a test program. The ACRS continually asks for testing/research to better define Acceptance Limits with no regard to the Margins available. If the margins are much larger than the uncertainties associated with the limits, any further refinement is overshadowed by the conservatism built into the margins. Therefore, there is no real benefit realized, but the costs are very large.

This type of philosophy is prevalent throughout the NRC mandated GSI-191 testing requirements. I believe that one of the main reasons for this is that NRC (and the ACRS in particular) constantly mixes up the terms prototypical vs. conservative with regard to testing (this is evident when reading the ACRS meeting transcripts). The ACRS, and many of the NRC staff don't even understand the fundamental differences between the expected conditions in the actual plant versus the simulations used for the testing. Most of the NRC test requirements don't even remotely approach prototypicality (in other words - matching what actually would happen in the plant). When discussing the vendor test methods, the NRC staff consistently forces the industry to be ultra-conservative, then complains that the test results are not prototypical. These are diametrically opposed concepts. It is physically impossible to satisfy both requirements at the same time - to make the tests ultra-conservative they can't be prototypical. The NRC staff has the responsibility to stand behind it's position that the conservatisms required outweigh the prototypicality, and the ACRS needs to accept that position without asking for each nuance to be tested ad infinitum. The other option would be to allow the vendors to do testing with the prototypicality modeled, or use real-world experience, and accept the advantages of realism over ultra-conservatism (this would have had a substantial impact on the subject of coatings, which is the most egregious example of NRC over-reaction on an issue).

The other big picture item missing in discussions regarding GSI-191 is that "it is the NRC's responsibility to define an Acceptance Limit" of some type. Without this, the problem can never be solved. The tendency to ask the industry to "go bring me a rock", then tell them what the NRC doesn't like about the "rock" is a very inefficient and costly process.

Another example of where the NRC is not performing in a "superior" manner is the way it allows itself to be manipulated by Congress. Isn't it time for NRC to stand up for the taxpayer/ratepayer as it relates to Yucca Mountain? U.S. Senate Majority Leader Harry Reid would like nothing more than to make Yucca Mountain a continuous, perpetual research project (I'm sure the ACRS is proud of him) - that way, the federal government continues to pump money into his state (money that is taken from all the other states). This is essentially government sanctioned extortion for the benefit of the state of Nevada. When is the NRC going to say that it has "reasonable" assurance?

In my current job, I have had the opportunity to review NRC RAI's related to the Westinghouse AP-1000. My conclusion is that the "new" process that is supposed to be defined by 10 CFR 52 is a dismal failure. I have been personally involved in a number of NRC RAI's that are generic "fishing expeditions": RAI's that do not provide any explanation as to the deviation from the approved DCD or it's significance, repeat RAI's, RAI's that are answered in information available to the NRC (so the only answer that can be provided is "look here" or "read the document provided"), RAI's covered by an existing plant's Emergency Plan, RAI's where the NRC is using the RAI process to re-confirm the Oath & Affirmation process, etc... The responses to these RAI consume a significant amount of time and resources, and provide little, if any, benefit. The costs associated with this effort are ultimately passed on to the ratepayer/taxpayer. This amounts to a governmentally initiated taking of ratepayer/taxpayer dollars with minimal or no benefit. Wasn't all the work/effort/planning that went into the 10 CFR 52 process and the new Office of New Reactors meant to keep this from happening?

In closing, I want it to be known and understood that I am not on some kind of "witch hunt", and in general, believe that the NRC is doing a fairly good job most of the time. For the most part, I was happy to work there, and proud to serve my country. Most of the people that work there are certainly trying to do their best. I was compelled to write this letter for two reasons: One: to protect my professional integrity - when I ask the standard legal questions: "What did I know?", "When did I know it?" and "Who did I tell?"; it puts me in a position where I have to tell someone. And two: my personal integrity - if I'm not willing to help make things better, then I am part of the problem.

Please consider this information as you wish. If you believe you need more information or would like to speak further, please contact me in whatever way is most convenient.

Sincerely,



Thomas R. Hafera

