

Oversight Panel Member Arnold Gundersen's Testimony to the Vermont State Legislature

Thursday, March 19, 2009

Thank you for asking me here today to discuss my participation as a member of the Act 189 Vermont Yankee Audit Oversight Panel. I would like you to know that our report is a consensus report. As the Department of Public Service (DPS) implemented Act 189, I concur with the group consensus that it *may* be possible for Entergy Nuclear Vermont Yankee to operate for an additional 20 years. However, Act 189 did not require, nor does the Audit itself contain, an assessment of just how difficult that process may be.

I believe that Entergy faces enormous challenges to operate ENVY past 2012. To me as an Engineer, many of these problems *may be* surmountable if taken individually, however, neither Act 189 nor the NSA Audit required a broader perspective of how these pieces all fit together. As a former nuclear engineering Senior VP with more than 35-years of nuclear engineering experience, I believe it will be extraordinarily difficult for ENVY to continue to operate reliably due to the corporate cultural problems uncovered by both the Oversight Panel and the NSA Audit.

Although NSA used only one-third of the person hours allocated by Act 189 for the ENVY Audit, both the Oversight Panel and NSA uncovered many significant obstacles to ENVY's reliable operation past 2012. I have categorized the problems we uncovered into two categories, which I call mechanical and cultural obstacles. Although there are numerous mechanical problems, like the condenser, MSIV's and the cooling towers, I am more concerned about the endemic cultural obstacles facing ENVY. While individual components may be repaired or replaced, cultural obstacles and corporate mindset take many years to rectify, and such cultural improvements are much more difficult to measure, analyze, and improve.

The endemic cultural issues I believe will be difficult to rectify include:

Staffing Problems:

According to the NSA Audit: 85% of the Auxiliary Operators, 86 percent of the Instrumentation and Control Engineers and 57 percent of the Electrical staff has worked at

ENVY for three years or less. This should be a major concern to all of us because aging engineers and key retirements mean that tribal knowledge of how ENVY was built and is operated is being lost. While ENVY's current-operating procedures may work for an older more experienced staff, they are entirely inadequate for new hires. These are all endemic, long-term management problems.

For example:

ENVY informed the Panel that it deliberately understaffed the plant because it does not get extra improvement in performance compared to the cost of hiring a larger staff, unlike the top 25% of well-staffed plants in the US, which claim a larger staff improves plant performance.

ENVY also claimed that a smaller staff is a management strategy to save money, and it remains satisfied with staffing at the middle level of power plants rather than staffing to meet best performing plant status.

However, in spite of its stated goal to not staff the plant to top quartile status, ENVY is still understaffed by an additional 40 employees. ENVY had 83 new hires just last year, which is almost 20% of the plant's entire work force. Why, we must ask, are so many employees quitting?

Root causes of the Fire and Collapse:

According to the data we reviewed, the cooling tower collapse and the transformer fire were preventable had Energy's management acted appropriately. The Root Causes of cooling tower collapse and transformer fire were:

- Failure to look at industry-wide problems
- Inadequate Inspections
- Resource Restrictions

Resource Restrictions:

Resource Restrictions underlie all the problems at ENVY. This is a fancy way of saying that ENVY is not spending enough time or money on inspection or repair. Examples include:

1. The cooling tower collapse.

2. The Flow Accelerated Corrosion program failures.
3. The condenser, which was not expected to last until 2012 in VY reports dating back to 1999 and 2002, which show that ENVY has had plenty of warning regarding the condenser for 10 years.
4. Staff limitations.

Corrective action program:

A Corrective Action program identifies repairs and problems that need to be solved. Instead of solving its Corrective Action problems, ENVY has a large backlog of unsolved issues. Worse still, ENVY is “gaming” the system by converting its already lengthy Corrective Action issues into work orders in an effort to make the backlog appear smaller. This practice is unacceptable. Industry-wide, poor corrective action programs have been a leading indicator of plants that have ended up with year-long outages, certainly a critical reliability concern for us. However, let me be clear that no matter what assessments are performed, there is no guarantee that an aging plant like ENVY will not have issues that will cause an outage lasting at least a year or more.

Half of the US reactors have shutdown for at least one-year outages, and most of them were unaware they were facing a long shutdown even the day before their shutdowns happened. According to a study conducted by UCS, the one common denominator among all the plants with a year or longer outage was a weakness in their corrective action program.

Engineering and Inspection capability:

There are indications of significant weakness in both these areas. Examples include:

1. Bottom quartile of all US nuclear plants on Equipment Reliability Index.
2. Poor design of tower clamps.
3. The ENVY in-house engineering staff completely disregarded the fact that wood floats and fiberglass sinks therefore risking a possible clog to the cooling tower basin drain, which impacts both plant reliability and safety.
4. ENVY did not enter required data into its Checkworks program from 2002 until December 2006. There are five years of missing data. Due to this missing data, false

information was provided by ENVY to New England Coalition during the 2008 NRC ACRS hearings held in Newfane.

5. Main Steam Isolation Valves leakage: five times higher than before Uprate and half of that leakage is from just one of the four lines.
6. Weak Cooling tower inspections in 1994, 1997, and 2007
7. VY was aware of problems with its cooling towers since 1980, Entergy had a meeting in 2002 regarding this issue and were fully informed.
8. ENVY has a pattern of creating one problem in order to solve another (debris, gamma shield, joints in fiberglass).

Endemic management obstacles:

All the items delineated above are endemic management problems that are not readily solved. These obstacles are difficult to overcome because they are systemic to Entergy's entire corporate organization. Furthermore, how will we measure an "improvement", if there were one, in such systemic cultural issues?

Finally, ENVY will be significantly challenged to overcome both the cultural obstacles and mechanical repairs the Panel and Audit identified, while at the same time Entergy Nuclear must continue to reliably operate Vermont Yankee with its currently inadequate size staff, planning for the 2010 outage, and attempting to implement the aging management system required by NRC.