



Background on the Hanford Waste Treatment Plant

December 2011

Overview:

The flawed safety culture at this dangerous and expensive nuclear site is suppressing serious safety issues in the name of meeting deadlines.

- The Space Shuttle Challenger, Deep Water Horizon in the Gulf, and Fukushima were all preventable disasters that involved engineers and scientists whose concerns were suppressed and ignored.
- The top three scientists and engineers at the Hanford Waste Treatment Plant – all from different disciplines – are blowing the whistle on the safety problems, and getting harassed and removed from their jobs as a result. They are: Dr. Walt Tamosaitis, the former Research and Technology Manager, Dr. Don Alexander, DOE's chief scientist, and Donna Busche, Manager for Environmental and Nuclear Safety.
- Hydrogen gas fires and explosions are now considered credible, and so are uncontrolled nuclear criticalities. A release of these materials to the environment could be catastrophic.
- A federal agency, the Defense Nuclear Facilities Safety Board, has intervened and issued [findings](#) and recommendations on the flawed safety culture, but the Department of Energy has refused to accept their recommendations.
- Meanwhile, the plant continues to be built, faulty design and all, and we will soon find it difficult to operate the plant safely and effectively.
- We can prevent a future catastrophe only if we fix the safety culture.
- Energy Secretary Steven Chu released a new (December 6, 2011) policy on Safety Conscious Work Environment. Like many other such pronouncements, it lacks any enforcement framework and simply lays out expectations without consequences. Hanford Challenge responded to the new policy with a letter requesting that he implement enforceable regulations that require contractors and the Department to establish and maintain a Safety Conscious Work Environment similar to the NRC's enforcement mechanism codified at 10 CFR 50.7.

Background

1. The [Hanford nuclear site](#) made plutonium for the weapons program, and now is the largest and most contaminated site in America.
2. Hanford contains 56 million gallons of high level nuclear waste in leaky underground tanks. Already, at least one million gallons of this waste has leaked from about a third of the 177 tanks. All of

the tanks are beyond their design lives – they were meant for temporary storage only. The waste in these tanks threatens the NW ecosystem, and presents a long-term threat to the health and security of many future generations.

3. The Hanford Waste Treatment Plant is being built to be the solution to treat that waste by mixing the waste into molten glass, which will be poured into canisters, allowed to cool, and shipped off for deep underground storage. Originally scheduled to begin producing glass logs in 2011, the schedule slipped to an opening date of 2022. Recently, the DOE announced that even this opening date was likely not going to be met.

4. The Waste Treatment Plant (WTP) is a dangerous facility because it will separate and mix the high level waste. The wastes are very radioactive and contain flammable and explosive chemicals, such as hydrogen gas. A release of high level waste from the Waste Treatment Plant could be catastrophic.

5. The WTP project is severely behind schedule and over-budget. There is tremendous pressure on the project to show progress, meet deadlines, and stay within (the already bloated) costs. For instance, there is legally-binding agreement with the State of WA to meet deadlines, which will not be met, even though it is a decade behind schedule already. The costs will now exceed \$13 billion, from the originally projected cost of \$4.6 billion.

6. The plant is a one of a kind facility handling unique challenges. The exact chemical composition of the wastes is poorly understood.

7. Unwisely, the government early on decided to use a “fast track” approach to design and build the facility at the same time.

8. The technical complexities have mounted, even as the site has gotten locked into a design that appears to be a failure. Partly this is due to the inadequate understanding of the wastes. For instance, it was only recently determined that the plutonium particle size in the waste exceeded the design capacity of the plant – making unplanned nuclear criticalities more likely. The DOE and the contractor have been heavily criticized for mismanagement of this project in past Government Accountability Office (GAO) reports.

9. In early 2010, Dr. Tamosaitis raised concerns over mixing – which could lead to hydrogen gas buildup, with fire and explosion possible, and criticalities. These aren’t new issues, but Dr. Tamosaitis’ dissent is over management declaring that these issues are closed, when in fact they are not resolved.

10. In early July 2010, Dr. Tamosaitis was removed from project after filing some 50 technical and safety issues – and the day after Bechtel claimed that it had closed the mixing issue, making it eligible to receive a \$5 million fee. Dr. Tamosaitis was not allowed to retrieve his personal belongings, nor was he given an explanation for the sudden removal. He assigned to a windowless basement office for 16 months, and given few meaningful assignments, did not report to a supervisor, nor invited to attend meetings.

11. Shortly thereafter, Dr. Tamosaitis blew the whistle in a detailed [letter](#) to a federal agency, the Defense Nuclear Facilities Safety Board, which opened an investigation into his concerns. The Board held hearings in October 2010, and issued findings, including a stunning June 2011 letter on Safety

Culture to the Secretary of Energy. This letters finds that the safety culture at Hanford is flawed, and that there is a chilling effect on the ability of workers to bring forward concerns.

13. DOE chose to disagree with the findings of the DNFSB and has failed to take concrete action to address the safety culture issues, choosing instead to demand the files of the DNFSB. Secretary Chu issued a safety culture policy on December 6, even as the number of technical dissenters is on the rise.

14. On December 6, 2011, Dr. Tamosaitis [testified](#) in front of a Senate Committee, which received media attention, including in the [Washington Post](#) and the [Associated Press](#).

15. In the meantime, two new senior managers have gone public with their grave concerns about the integrity and safety of the Waste Treatment Plant's design.

16. Dr. Don Alexander, DOE's chief physical scientist, maintains that recent small scale tests of the mixing platform reveals that corrosion and erosion presents a significant problem for the life of the mixing vessels and piping. He [publicly revealed](#) dramatic evidence of the erosion/corrosion problem, and he estimates that the vessels will not last ten years at the rate of damage that he calculates. He likens the use of the Pulse Jet Mixing technology to using a sandblaster, which inexorable eats away at the tank, the nozzles, and the piping. These vessels, once installed and put into operation, cannot be accessed or repaired, and are expected to operate for 40 years.

17. Dr. Alexander also maintains that site management should stand down at least some construction components of the pretreatment systems until the issues are resolved. He worked with the employee union, the AFGE, to file a Stop Work request, which was immediately overridden, and then he filed a Differing Professional Opinion (DPO). The DPO was validated as to the technical issues he raised, however, the DPO team accepted the DOE's position that it had the authority to "take the risk" of failure. Dr. Alexander strongly maintains that the decision to continue fabricating and installing vessels violates the nuclear safety regulations.

18. Donna Busche is the Environmental and Nuclear Safety Manager on the WTP project. She testified before the DNFSB in a [hearing](#) held in October 2010. Her testimony conflicted with the narrative prepared by the contractor and the DOE, and she testified that she could not accept the models used by the contractor to justify lowering safety standards. For instance, Bechtel is using a model that understates the severity of contamination should a release occur from the facility, and the impact on the public. A more traditional model shows a greater impact. Similarly, Busche disagrees with the use of a risk model that she believes inappropriately downplays safety issues such as hydrogen gas fires and explosions, based on likelihood of the event. Again, a more traditional model (such as used by NRC) would focus on the consequences of an accident, and assign stringent back-up safety systems to guard against a release.

19. Ms. Busche is concerned that cost and schedule are inappropriately driving the decisions of the contractor and Bechtel, compromising safety and quality.

20. As a result of Ms. Busche's testimony, she alleges she was harassed and intimidated by both contractor and DOE management, and asked to change her testimony. In October 2011, she was given a retaliatory disciplinary action. She filed a [complaint](#) with the U.S. Department of Labor in response.

21. DOE officials have also been involved in allegations of harassment and discriminating against top managers for raising safety and technical concerns. [Evidence](#) reveals that a senior DOE official, Dale Knutson, was involved in the decision to remove Dr. Tamosaitis, and may have played a role in blocking his reinstatement, declaring to management that he did not want a whistleblower on the project. In Busche's case, the Assistant Secretary of Environmental Management, Ines Triay, targeted Busche in a large debrief meeting after the first day of DNFSB hearings, saying to Busche, if it was "[her] intent was to piss people off [with her testimony], [she] did a very good job," according to the complaint.

22. In light of DOE's involvement in discrimination against whistleblowers, along with their expressed duty to enforce anti-discrimination policies against whistleblowers – external and independent oversight is obviously needed. DOE has failed to investigate a single instance of reprisal against the top managers (or others) even as the evidence mounts of retaliatory animus.

23. DOE has consistently refused to implement a regulatory framework that can enforce work cultures at nuclear sites that promote the internal reporting of safety concerns, free of the fear of retaliation. Instead, as Congressman Burr stated in a 2000 hearing on whistleblower retaliation at DOE: *"This familiar cycle at DOE begins with a genuine understanding of a problem, then a commitment to reform, and then an announcement and lengthy press release from DOE headquarters describing how they will resolve the problem, but the Department always seems to forget to follow through on these reforms."*

24. The Defense Nuclear Facilities Safety Board (DNFSB) has displayed the integrity and independence to demand rigorous nuclear safety requirements at DOE facilities. However, the DNFSB does not have enforcement or regulatory authority. The DNFSB has specifically called out DOE for its flawed safety culture at the Hanford site, yet all it can do is issue recommendations. This can be addressed through legislation.

For more information, visit Hanford Challenge's [website](#).