



February 19, 2008

Patti Silva
Office of Nuclear Material Safety and Safeguards
Mail Stop EBB-2-B02
Washington, D.C. 20555

RE: NRC Review of the Hanford Waste Treatment Plant

Dear Ms. Silva,

I attended the public meeting held by the NRC, and hosted by you, on Wednesday, February 13, 2008 at the Hanford House hotel in Richland, Washington. Thank you for taking the time to present the scope of the NRC's proposed activities relative to the review of the Waste Treatment Plant, and for answering our numerous questions and listening to our comments.

I am writing to repeat my request for a meeting with some or all of the members of the NRC review team on the WTP project in order to share information which we believe relevant to your review. We acknowledge that the small NRC review team faces a daunting challenge under a tight schedule. By pointing out areas of concern and meeting in person to answer questions and provide closer detail, we believe we can help NRC produce a more effective review in the short time allotted.

The rest of this letter will attempt to outline our areas of concerns.

Throughout the design/construction phase of the Waste Treatment Plant (WTP) at Hanford, deficiencies in the design have been continually hidden, under-reported and left unaddressed. These hidden deficiencies threaten the future integrity of the project and the safety of plant workers and the public.

Most of these deficiencies fall into one of three categories:

1. Those where the design does not meet the safety standards (Authorization Basis) established for the project.
2. Those where quality requirements for the project were not appropriately followed.
3. Those where the Project created authorization basis processes not prescribed by 10 CFR 830 or DOE Orders related to safety were not well implemented, maintained, or adhered to (e.g., the "triple 0" documents. DOE/RL-96-0003 through DOE/RL-96-0006; the AB Amendment Request (ABAR) process)

Design deficiencies, where safety standards were not followed, and the failure to implement an effective Quality Assurance program have resulted in construction deficiencies that can become safety threats. The problem is that we only know the tip of the iceberg – many such discovered deficiencies were in fact misreported, unreported, or covered up and never addressed.

A close look at the first five years of the Project raises questions about the character and competence of the entities entrusted with designing, building and regulating this vital facility for treating Hanford's waste without third-party oversight. Considering the seriousness of Bechtel and DOE's failures, a new more trustworthy third party is clearly needed to intervene and provide much needed oversight of the remaining construction and design of the Waste Treatment Plant.

Background

As you are no doubt aware, interest in the Waste Treatment Plant (WTP) has increased greatly during the last several years due to questions regarding the reliability of its design and construction in delivering a safe and viable plant. Specifically there has been a high level of public, congressional, and media interest in some of the problems resulting from the programmatic breakdown in nuclear safety and quality systems at the WTP project.

The problems became apparent with the installation of a defect-ridden 8,000 gallon Submerged Bed Scrubber vessel, a tank meant to collect extremely toxic, superheated high-level radioactive waste vapors during the vitrification process. Internal documents show that DOE and Bechtel both knew the vessel was flawed when it was installed. The specifications provided to manufacturer for the design were incorrect and the workmanship was poor. Incredibly, internal reviews identified the fact that the wrong design specs were provided, and the issue was flagged several times, with no corrective action taken. Further inspections on the workmanship once the vessel arrived at the plant uncovered defective workmanship including bad welds, and the vessel fabrication was found to be inadequate. Further, corrective actions were applied inappropriately.

The receiving Quality Control function should have identified the defects, including the fact that the wrong ASME codes were provided to the supplier. If not for the observations of an independent inspector reporting to the state and imposed on the WTP project by the State of Washington, the corrective actions may not have been completed as committed to in the corrective action documentation¹.

In the case of this particular vessel, the location was to be in a "black cell". A "black cell" area is designated as inaccessible after the plant begins operation due to the lethal amounts of radioactive material in the area during the processing of the waste. The failure of any such vessel could be disastrous: any resulting leak from poor design or craftsmanship could force the plant into an early closure and put the surrounding area at risk of contamination. It was later realized that up to 66 other "black cell" vessels in various stages of completion were also designed using the wrong specifications and had to be corrected.

¹ See Government Accountability Project's website for details and documentation on the vessel history.
<www.whistleblower.org>

This is a critical example of the failure of both DOE and Bechtel to ensure quality and safety requirements are met. Quality requirements, as cited in 10 CFR 830, Subpart A, establish the criteria for work processes, design, inspection, acceptance, testing, and assessment activities. If the quality processes had been clear and implemented properly, none of the errors on the vessel would have occurred.

What was behind the numerous errors and breakdowns in procedures surrounding this critical nuclear component? In a word: money. The contractor, Bechtel, was rushing to meet a contractual milestone that awarded them \$45 million in fee if the tank were installed within a certain timeframe. Bechtel barely met that timeframe, and only by installing a tank it knew to be defective. The day after the tank was installed, Bechtel demanded, and received, its \$45 million. The installation of this flawed vessel is but one example of the systemic breakdown in the production-over-quality mentality typified by DOE's "fast track/design build" method to accelerate construction (a method roundly condemned by the GAO). The overemphasis on production and the push to finish the plant has caused negligence on the part of DOE and Bechtel in maintaining safety and quality. The deficiencies in the implementation of safety standards (Authorization Basis) were further exacerbated by the systematic weakening of oversight by DOE. These were the root causes of many of the failures, like that of the vessel, that have led to design errors, delays, and cost overruns. Currently the cost has increased by 150%, from \$4.3 billion to \$11.55 billion and perhaps is rising further while the completion has been delayed to 2019².

Summary: Authorization Basis-related deficiencies

Throughout the design/construction phase of the Waste Treatment Plant (WTP) project, internal records and the testimony of insiders evidences that the deficiencies in the design have been continually hidden, under-reported and left unaddressed. Many of these deficiencies include those wherein the design does not meet the safety standards established for the project, specifically, the Authorization Basis. Theoretically, where there is a conflict between the design and these safety requirements, either the design or the safety requirements must be changed so that they do not conflict. These changes need to be reviewed by qualified engineers and the oversight organization, in this case DOE.

In the early phases of the project, DOE did review both the original design and the changes to the design, as the design evolved into the construction phase. However, Bechtel's managers at WTP did not want burdensome oversight, asked for relief, and DOE seemed to oblige them, by granting them more and more autonomy, relinquishing their own oversight in the review process, in conflict with the implied review processes DOE is to perform per 10 CFR 830, as defined in the glossary for Documented Safety Analysis – Preliminary Documented Safety Analysis.

² Aloise, Gene. Government Accountability Office. Testimony before the Subcommittee on Energy and Water Development and Related Agencies, Committee on Appropriations, US House of Representatives. April 6, 2006.

- In 2002, Bechtel requested that DOE relax its oversight for Authorization Basis changes³, DOE agreed allowing Bechtel to make certain changes independently⁴.
- Minimal DOE oversight in reviewing Authorization Basis changes was a cause of non-compliance⁵.
- A 2005 report by Bechtel regarding Authorization Basis stated that revisions made to the Authorization Basis in 2002 and 2003 resulted in multiple design deficiencies⁶.
- In 2003 Bechtel made an effort to conceal an improper closure of a Corrective Action Report written regarding its deficient Authorization Basis management process⁷.
- In 2003 a Bechtel report of the Authorization Basis discussed several non-compliances however they were not reported to DOE in the Price-Anderson Amendments Act reporting system, called the Noncompliance Tracking System⁸.
- A second report written in 2003 reviewed similar non-compliances and safety evaluations that were found to be missing. The non-compliances found were chronic and reportedly could have led to a less conservative design of the facility, yet Bechtel again decided not to report⁹.
- A third Bechtel report on the same kind of non-compliances was discussed in 2004 at a meeting where the voting attendees decided to report the non-compliances—but the vote was overturned by a re-vote by email (which did not meet the requirements of the project procedure) so that the non-compliances could continue to appear less obvious¹⁰.

By failing to report significant non-compliances between the design and safety requirements, Bechtel could continue design/construction but at the cost of a facility lacking not only reasonable safety but the assurance that it could even operate. While it is important that the plant be built quickly, it is more important that it be built to operate within acceptable risk parameters. In the past, accelerating the construction/design has caused even longer delays due to mistakes and overlooked safety concerns that would likely not have occurred if the Authorization Basis had been seriously maintained and the requirements to maintain it kept current with the design applied.

Summary: Quality Related Deficiencies

The basic purpose of any quality assurance program is to deliver a quality product. The personnel in the quality assurance program are supposed to find problems related to quality so that the responsible personnel on the project can fix them, and fix them well enough so that the

³ Veirup, A.R.. Letter to DOE, Michael K. Barrett. April 17, 2002.

⁴ Barr, Robert C. Letter to Bechtel, Ron F. Naventi, May 2, 2002.

⁵ Bechtel Price-Anderson Office, Authorization Basis, PAAA-2005-0001. 2005.

⁶ Schuette, Heidi, Analysis for 24590-WTP-CAR-QA-05-006, Inconsistencies Involving Design Documents and the Authorization Basis, March 16, 2005

⁷ Employee Concern, Letter to DNFSB, Steven Stokes, September 17, 2003

⁸ Murphy, Dennis W.. Authorization Basis Maintenance. PAAA-2003-0004. July 28, 2003.

⁹ Papworth, L.G.. Authorization Basis Safety Evaluations. PAAA-2003-0006. November 20, 2003.

¹⁰ Davis, Bob. Price-Anderson Review Board Memo to Bechtel, Jim Henschel. June 21, 2004.

problems do not come back. Quality Assurance programs DOE nuclear facilities not only are intended to ensure delivery of a quality product but are also key elements in support of safety management at these facilities.

Unfortunately, the Quality Assurance programs for the Waste Treatment Plant project have historically been subverted. The system has been such that problems were often disguised and personnel were actively discouraged from reporting or correcting them. This is often due to an attempt by management to keep the project schedule as a priority and maintain Bechtel's external image. There are several key examples of methods Bechtel has used to subvert Quality.

- An unofficial database was constructed to minimize quality problems and keep them less known. This system tracked “non-quality” issues on the surface, but some quality-related issues were contained improperly in this database. The database gives recommendations, but unlike the official database, these problems are not formally tracked for systemic issues. Further, except for during a year between 2002 and 2003 Bechtel's Price Anderson Authorization Act (PAAA) staff was not allowed to examine these reports and DOE rarely looked at them.
- In 2004, the PAAA staff were forbidden from reviewing documents other than those listed in a new, restrictive issue of the PAAA procedure. The list of documents to be examined fell short of the expectations in the PAAA guidance documents:
 - Currently “Archived” and Superseded (as of 2007):
 1. DOE Enforcement Program Roles and Responsibilities Guidance Handbook;
 2. Identifying, reporting, and Tracking Nuclear Safety Noncompliances
 3. Operational Procedures for Enforcement
- These 3 documents have been since superseded (2007) by the current Enforcement Process Overview (specifically Par IV, Compliance Assurance and Reporting, Noncompliance Identification).
- These documents suggest robust screening processes for the PAAA coordinator and his/her staff, to include internal assessments and external assessments. This was truncated by a revision to the PAAA procedure in 2004/2005 timeframe, whereby PAAA staff were limited to reviewing only the findings in internal assessments. The result was that they could not second-guess the QA assessment staff's conclusions on findings. Unfortunately, the QA assessment personnel were not always objective. There were cases whereby they allowed Corrective Action Reports to close inappropriately. For example, in one case related to the AB, the AB staff were to write a new procedure but failed to complete it. The QA staff responsible for the Corrective Action Report (CAR) closed it by citing an unrelated design document, instead. When the PAAA staff discovered this gross “error”, the CAR was re-opened. There were 3 separate editions of the CAR found on the CAR database during that month. The QA manager from then on stated that the database did not contain record copies although previous documents had consistently stated that the copy of the CAR in the CAR database was the record copy. By changing philosophies, the QA department was allowed to subvert the CAR process without having to admit their inadequate CAR closure processes. Although a CAR should have been written on this incident, as a noncompliance with the CAR process, a new CAR was not written.

- When deficiencies were later raised with the AB processes, this issue was never identified. Evidence of this can be provided as requested.
- Additionally, design issues were not screened by PAAA staff. They included issues reported in DVRs and DVARs.
- Some employee concerns, sent as correspondences to the Project Director, were never screened by PAAA staff. The Employee Concerns staff were not included in distribution, and therefore, the concerns were never screened by PAAA staff. Examples of this can be provided on request, as well.
- The project placed strict rules on external inspectors, including the DOE. They did not inspect areas or documents that Bechtel did not want inspected, there were guidelines as to timing of visits from DOE before audits, and the Quality Assurance Department provided individuals to serve as “shadows” during DOE inspections. DOE inspectors were forbidden from conducting impromptu audits.

This subversion of the quality-related program has direct and potentially dire consequence for the operation and safety of the Waste Treatment Plant. Some problems have now become too big to hide. The improper installation of the aforementioned scrubber vessel was due not only to violations of the Authorization Basis but also to Quality Assurance’s general methods of subversion. Another example comes from a concrete pour done in weather hot enough to compromise the concrete. Despite objections from an employee of the Quality Assurance department, management went ahead with the pour and consequently the concrete later was deemed unreliable. This was concrete that would be directly under the melter for the vitrification process. It is shocking that a member of the Quality Assurance team was ignored and overridden, and attributable to the fact that the QA function was subservient to the construction manager and had no independent authority, a clear violation of principles enshrined within 10 CFR 50, Appendix B.

The Diffusible Hydrogen Issue

In spring of 2003, there was an incident where carbon steel was purchased, even though it did not meet the specification to protect this steel and its connection welds from failure due to corrosion potential from excess hydrogen in the weld filler material. The specification was conflicting and vague, so that it would be impossible for the vendors to understand what the contractor actually wanted. There were three separate vendors who incorrectly interpreted the specifications. The steel had been inspected by quality control and accepted by both quality control and field engineering. A root cause analysis objectively stated that there were problems with the specification and with the inspections completed by supplier quality, quality control, and field engineering. It was obvious that numerous barriers for quality assurance had been broken.

Of the seven corrective actions suggested in the root cause analysis and the corrective action report, three involving specification issues were rejected by the engineering manager and were pointedly ignored until late 2003, when the corrective action report was due for closure. At this point, the engineering manager refused to complete corrective actions on two of the three issues, and only partially addressed the third. At the agreement of the quality assurance manager, the corrective action report was closed without initiating or completing the corrective actions. There

was no management support to report this into the DOE tracking system for non-conformances and deficiencies.

Authorization Basis Processes Noncompliant with DOE Safety Basis Requirements

The project created new processes not defined by the Authorization Basis requirements contained in 10 CFR 830 or DOE Orders in order to exempt whole chapters of the PSAR [PDSA] and to allow a longer timeframe in ensuring compliance with the PSAR. This novel, “jury-rigged” process led to the advent of the Safety Envelope Document (SED) system, which is not prescribed by any DOE Order or by any of the DOE/RL-96-0000 series documents listed above. Configuration management of the Safety Basis is not kept current as required by 10 CFR 830, Subpart B. The Preliminary Documented Safety Analysis contains the Preliminary Safety Analysis Reports. Parts of these were designated the “Safety Envelope Documents”. Only these parts of the PSARs are updated. Although not officially part of the Authorization Basis, this nebulous group of documents are used as the authorization basis for the project. Screenings are executed to them, rather than the official Authorization Basis documents. They are updated on only a yearly basis, not in real time. Therefore, the SEDs are not maintained current. Up to a year can lapse before noncompliances between design/construction and the authorization basis are detected. By that time, design and construction will have progressed and it may not be possible to make corrections when AB noncompliances are discovered. It is much more difficult and expensive to back-fit.

Additionally, when the draft of DOE Technical Standard DOE-STD-1189-XXXX, Integration of Safety Into Design, is finalized later this year, the project will have progressed beyond the point of ensuring compliance with this new standard.

Miscellaneous Issues

Lack of Oversight

DNFSB

Unfortunately, there has been a paucity of DNFSB correspondences and technical reports since 2006. The DNFSB seems to have taken a hiatus from reporting Complex-wide. One DNFSB staffer, Mark Sautman, wrote some increasingly scathing reports on the project in early 2005, in his weekly DNFSB reports, particularly in the following weekly reports:

January 21

February 4

February 18

March 25

He was re-assigned to Savannah River site in late March of that year.

State of Washington

The State of Washington Department of Ecology had pledged to provide independent oversight of the project in July 2007. A contracting agency has just recently been hired, but no personnel have appeared on the project yet to provide state oversight.

This NRC review is our only hope for oversight of any type.

Record-Keeping Issues

When PAAA personnel brought issues to light regarding the failure of WTP Document Control and Records management to meet the Quality Assurance Requirements Document (QARD) [required for waste being shipped to Yucca Mountain], the project director responded by directing the Document Control and Records Management manager to remove even the last meager form that only weakly met the requirements. After that point, there was no way for the project to demonstrate that it could comply with the QARD's requirement to provide "changes and reasons for changes" to implementing documents. A reason for the revision was listed on a Document Control form, but it was not a "Quality" record. There are no reasons listed for the individual changes to the documents. It is impossible to determine who directed any changes and the reasons. It is therefore impossible to know – whenever requirements are deleted from the implementing documents – who ordered the deletion or their reasoning for the removal. For example, it is not possible to know who ordered the reduction of documents to be screened for PAAA noncompliances. Requirement removal is only discovered by comparing procedural revisions.

Conclusions

Please understand that the short summaries above have been taken from a much longer, detailed, and footnoted memorandum. Our concern is that work of indeterminate quality has potentially serious implications for ensuring the WTP will have adequate quality and safety in its design, procurement, and construction, as well as uncertainties that the plant will be able to effectively and safely operate.

Request for Meeting

We have learned this information with the help of insiders, Freedom of Information Act requests, and intensive research. We respectfully request the opportunity to meet and explain these issues in more detail and provide documentation that we believe will assist you in your review. It is our

belief that the subversion of the Authorization Basis and the Quality Assurance programs, not to mention the intentional suppressing of safety reporting, is well within the NRC's review scope and should be considered, along with any mitigating information that might be provided by DOE or Bechtel.

As I stated at the public meeting, we share a sincere concern with many in the community in the region and in the Tri-Cities, including engineers, scientists and craft workers who work at WTP, for the success of this project in safely dispositioning the millions of gallons of high-level nuclear waste stored at Hanford in unsafe and unstable underground waste tanks.

I hope to hear from you soon.

Sincerely yours,

Tom Carpenter, Executive Director
Hanford Challenge

cc: Bret Leslie, NRC
Alex Murray, NRC
Bob Pierson, NRC
Richard Miller, House Energy and Commerce Committee, Oversight & Investigations
Terry Tyborowski, House Subcommittee on Energy & Water Appropriations